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PRELIM BITS - MARCH 2024

1. HISTORY, ART & CULTURE

1.1 New GI Tagged Products

The Geographical Indications Registry in Chennai have given GI tag for Cuttack Rupa Tarakasi, Banglar muslin, Narasapur crochet lace products among others.

- **GI tag** – A form of certification that recognises unique products based on their origin.
- **Characteristics** – Products can be natural or man-made.
- India being a member of WTO, enacted the *Geographical Indications of Goods (Registration & Protection) Act, 1999* that came into force from 2003.

The 1st product in India to be accorded with GI tag was Darjeeling Tea in 2004-05. Tamil Nadu has the highest number of GI tags in India.

Cuttack Rupa Tarakasi - Jewellery

- It is a silver filigree, a form of metalwork in jewellery.
- **Geography** – Odisha.
- **Qualities** – Fine craftsmanship and luxurious design.
- **Origin** – As early as 3500 BCE in Mesopotamia, it was incorporated and even today it is done as Telkari work.
- **In India** – It might have reached Cuttack from Persia through Indonesia some 500 years ago by sea trade, also evidences shows the exchange of jewellery and gems between Kalinga and Indonesia.

The Banglar muslin – Handloom Craft

- **Geography** – Bengal.
- **Qualities** – This finest muslin is made of cotton, which are spun to create threads that maintained tensile strength higher than any other cotton products.

Narasapur crochet lace products

- **Geography** – Narsapur in Andhra Pradesh.
- **Qualities** – Intricate craftsmanship, unique designs and good quality crochet craft.
- **In India** – It was brought by missionaries to Narsapur.

Ratlam Riyawan Lahsun

- **Geography** – It is a garlic variety named after Riyawan village in Ratlam district of Madhya Pradesh.

Ambaji White Marble

- **Geography** – Gujarat.
- It is formed when limestone is re-crystallised under the earth's crust due to intense pressure and heat.
- **Qualities** – Pure white Colour with light grey veins.

Majuli mask

- **Geography** – Assam
- They are made in different variety and sizes as they are mainly divided into different categories
- **Mukha bhaona face mask** – It covers the face.

- **Lotokoi hanging mask** – It is bigger in size extends to the chest.
- **Cho Mukha huge mask** – It is a head and body mask.

Majuli Manuscript Paintings

- **Geography** – Assam.
- It has illustrated numerous stories and chapters taken from the great Hindu epics Ramayana, Mahabharata and above all subjects from the Bhagavata Purana.

Risa Textile

- **Geography** – Tripura
- It is common in almost all 19 indigenous tribal communities of Tripura. However, each community has its own design.

Lac Bangles

- A traditional form of jewellery made from natural resin and adorned with colourful stones and beads.
- **Location** – Hyderabad; **Type** – Handicrafts.

1.2 Lahore Resolution, 1940

India plans to celebrate the Pakistan National Day in March 2024 at the Pakistan's embassy complex in New Delhi.

- **Pakistan National Day** is observed on March 23, the day the **Lahore Resolution was adopted in 1940** by the Muslim League.
- **Adopted by** – All-India Muslim League during its general session in Lahore from March 22 to March 24, 1940.
- **Objective** – To formally call for an **independent state for India's Muslims**.
- **Causes** – Till the early 1930s, many Muslims had been agitating for better representation and safeguarding of their rights within the Indian Union.
 - Separate electorate granted to them in the Government of India Act, 1935, was a step towards that.
- However, as the decade progressed, the voices that demanded a total break from India got stronger.
- **Resolution** – No constitutional plan would be acceptable to Muslims unless it is designed on the following basic principle
- Demarcating geographically contiguous units with such territorial readjustments as may be necessary.
- Grouping the numerically Muslim majority areas like the North-Western and Eastern Zones of India into Independent States, where the constituent units shall be autonomous and sovereign.
- Providing constitutionals safeguards in other parts of India where the Mussalmans are in a minority and for other minorities in consultation with them.
- **Response by Indian Muslims** – Abul Kalam Azad and the Deoband ulema led by Husain Ahmad Madani criticised the resolution and advocated for a united India.
- **Consequence** – Though the resolution didn't mention the word 'Pakistan', it reached a point from which the Muslim League never turned back and lead to 2 independent states 'India & Pakistan'.
- **Significance** – In March 23rd 1956, Pakistan officially adopted its 1st Constitution, which transformed the Dominion of Pakistan to the Islamic Republic of Pakistan.
- Between 1960 and 1968, the **Minar-e-Pakistan** was built at the site where the resolution was adopted and the text of the resolution is inscribed at the base of the tower.

The Muslim League's 1940 Lahore session was held days after the **Khaksar tragedy**, when members of a Muslim group called the Khaksars, fighting for India's independence, were shot at by the British.

1.3 Kalagi

Kalagi town, earlier known as Kaluge, a wonder of Chalukyan architecture now languishes in neglect.

Chalukyas

- The Chalukya dynasty ruled large parts of southern and central India between 6th and 12th centuries as three related yet individual dynasties.
- **Chalukyas of Badami** - Ruled from **Vatapi** (modern Badami, Karnataka) from the 6th century to middle of the 8th century.
- They rose to prominence during the reign of Pulakeshin II.
- **Eastern Chalukyas** – After the death of Pulakeshin II, they became an independent kingdom and ruled from **Vengi** (modern-day Andhra Pradesh) until about the 11th century.
- In the western Deccan, the rise of the Rashtrakutas in the middle of the 8th century eclipsed the Chalukyas of Badami.
- **Western Chalukyas** - Rose in the late 10th century as descendants of Badami Chalukyas and ruled from **Kalyani** (modern Basavakalyan, Karnataka) until 12th century.

Kalagi

- **Location** - Karnataka.
- **Built during** - The reign of Kalyani Chalukyas (Western Chalukyas).
- **Significance** - The town once has a cluster of 101 temples and more than 30 monuments.
- Most of the temples belong to the Shaiva tradition and were built between the 11th and early 13th centuries.
- The temples follow the variant of Dravidian architecture popularly known as **Karnata Dravida style**.
- Kalagi was also the capital city of Mahamandaleshwar of a local feudatory.



Karnata Dravida Style Architecture

- The Hoysala kings ruled southern India from their capital **Belur** and later **Halebidu** in Karnataka and developed a unique idiom of architecture called the **Hoysala architecture** in Karnataka.
- This style is described as Karnata Dravida, and is considered an independent architectural tradition with many unique features.
- It is an **offshoot of the Western Chalukya style** and shows distinct Dravidian influences.
- Examples of this architecture are Chennakesava Temple in Belur, Hoysaleswara temple in Halebidu, and the Kesava Temple in Somanathapura.
- **Temples in Kalagi** - Suryanarayana Temple, Mallikarjuna temple, etc.

1.4 Statue of Valour

Prime Minister recently unveiled a 125-foot bronze statue of 'Ahom general' Lachit Borphukan in Assam's Jorhat.

Lachit Borphukan

- Lachit Borphukan was a legendary army commander of the **Ahom kingdom** (1228-1826).
- Borphukan ascended through the military hierarchy to attain the highest leadership position, having served in esteemed roles such as
 - **Ghora Barua** - Overseeing the royal horses,
 - **Dolaksharia Barua** - Commanding the royal household guards.
 - **Soladhara Barua** - He later became the Commander of the Simulgarh Fort and appointed as the Chief of the Ahom army by King Chakradhwaj, following his tenure as the monarch's Private Secretary, known as **Soladhara Barua**.



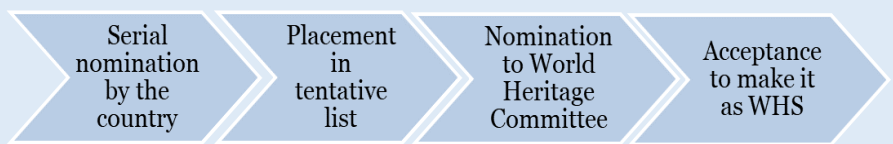
- **Battles** - In 1669, Aurangzeb dispatched the **Rajput Raja Ram Singh I** to recapture territories won back by the Ahoms in previous battles.
- **Battle of Alaboi** - The **Battle of Alaboi** was fought the Alaboi Hills in North Guwahati between the Ahoms and Mughals in which the Ahoms suffered severe reverses.
- **Battle of Saraighat** - In the **Battle of Saraighat (Naval battle)** in 1671 on the River Brahmaputra, he thwarted an invasion by the Mughal Forces under the command of Ramsingh I.
- Employing guerrilla tactics and strategic terrain selection, he guided the Ahom army to a conclusive triumph.
- He was buried at the 'maidam' burial grounds for Ahom royals and nobles at Hollongapar, after passing away a year after the battle at the age of 49 due to illness.
- **Lachit Diwas** – It is celebrated every year on 24th November Assam to commemorate the heroism of Lachit Borphukan and the victory of the Assamese army at the Battle of Saraighat.

1.5 Tentative UNESCO list

Six heritage sites from Madhya Pradesh earn a spot on UNESCO's tentative list.

Procedure to be included in World Heritage Site (WHS)


- **Selection criteria** – To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of 10 selection criteria of UNESCO.
- Only countries that have signed the World Heritage Convention can submit nomination proposals for properties on their territory to be considered for inclusion in UNESCO's World Heritage List.
- **Tentative List** – The first step a country must take is to make an 'inventory' of its important natural and cultural heritage sites located within its boundaries, known as the Tentative List.
- The World Heritage Committee cannot consider a nomination for inscription on the World Heritage List unless the property has already been included on the State Party's Tentative List.
- **Evaluation** – A nominated property is independently evaluated by
 1. The International Council on Monuments and Sites (ICOMOS)
 2. The International Union for Conservation of Nature (IUCN)
 3. The International Centre for the Study of the Preservation and Restoration of Cultural Property
- **Deciding authority** – Once a site has been nominated and evaluated, it is up to the intergovernmental World Heritage Committee to make the final decision on its inscription.


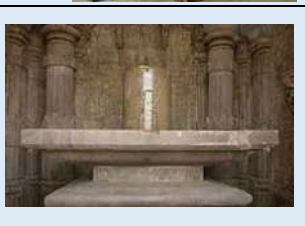

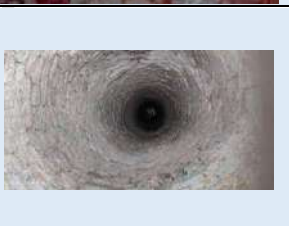


- The sites included in the new list included:
 - Gwalior Fort, Historical Group of Dhamnar, Bhojeshwar Mahadev Temple, Rock Art Sites of Chambal Valley, Khooni Bhandara, God Memorial of Ramnagar.

Other sites of Madhya Pradesh in the tentative list of UNESCO are Satpura Tiger Reserve, the historic ensemble of Orchha, Iconic Saree Weaving Clusters of India etc.

Sites included in UNESCO Tentative List

Sites	Features
Gwalior Fort	<ul style="list-style-type: none"> • Built in the 8th century, its origins can be traced back to Tomar dynasty. • It is strategically located on a steep sandstone hill, which provides a natural defense advantage. • It showcases a unique amalgam of Rajput, Mughal, and Hindu styles of architecture, a proof to the various dynasties that ruled the region. 

<p>Historical Group of Dhamnar</p>	<ul style="list-style-type: none"> This rock cut site consists of a total of 51 caves of varying sizes carved into the laterite hill. The hill consists of 2 groups of structures, the series of Buddhist caves and the hindu temple complex known as the Dharmarajeshwara temple. 	
<p>Bhojeshwar Mahadev Temple</p>	<ul style="list-style-type: none"> The origin of the town of Bhojpur can be credited to Raja Bhoj, the same man who founded Bhopal in the 11th century AD. The 12th century Bhojeshwar Temple is considered to be one of the finest examples of temple architecture in the region. Its core is the abstract representation of the deity Shiva, or 'linga'. 	
<p>Rock Art Sites of Chambal Valley</p>	<ul style="list-style-type: none"> At Daraki-Chattan in the Chambal basin in Madhya Pradesh, a cave in the quartzite buttresses of Indragarh hill. On the southern wall of the cave at Daraki-Chattan, small circular cupules that show conical depth and are about two million years old. The paintings dates back to the Megalithic Age. 	
<p>Khooni Bhandara</p>	<ul style="list-style-type: none"> It is an underground water management system comprising of 8 waterworks. These Mughal period waterworks of Burhanpur form one of the most significant historic water systems in India. It was built on similar Persian qanat approach in 1615 CE. 	

Ramnagar Ramlila

- Ramnagar Ramlila is a famous cultural event held annually in Ramnagar, **Madhya Pradesh**.
- It's a traditional performance that re-enacts the epic story of the Ramayana.
- It is known for its vibrant costumes, elaborate sets, and enthusiastic participation from the local community.
- It usually takes place during the festival of Navaratri and is classified as an **Intangible Cultural Heritage of Humanity** in 2008 by UNESCO.

1.6 Gandhi's Ashrams

Prime Minister of India has inaugurated the refurbished Kochrab Ashram and unveiled the Master Plan for the Gandhi Ashram Memorial at the Mahatma Gandhi Ashram in Sabarmati, Ahmedabad, Gujarat.

- Here, Gandhi and his co-residents sought to engage in acts of self-control and communal labour in the pursuit of spiritual and social liberation.

Settlements of Mahatma Gandhi			
Name	Year	Place	Country
Phoenix Settlement	1904	Natal	South Africa
Tolstoy Farm	1910	Near Johannesburg	
Kochrab Ashram	1915	Ahmedabad, Gujarat	India
Sabarmati Ashram	1917	Ahmedabad, Gujarat	
Sevagram Ashram	1936	Wardha, Maharashtra	

- **Historical Significance of Sabarmati Ashram** - From Sabarmati Ashram, Gandhi began Dandi march on March 12, 1930.
- He also launched the Champaran Satyagraha (1917), the Ahmedabad mills strike and Kheda Satyagraha (1918), the Khadi movement (1918), the Rowlatt Act and Khilafat Movements (1919), and the Non-Cooperation movement (1920) while living in Sabarmati.
- **Global Significance of Sabarmati Ashram** – Since 1963 it has been maintaining a visitors' book which records eminent visitors include Queen Elizabeth (1961), the Dalai Lama (1984-85), South Africa's former President Nelson Mandela (1995), and former US President Bill Clinton (2001).

Kochrab Ashram was the 1st Ashram established by Mahatma Gandhi after coming to India from South Africa in 1915. It is maintained by Gujarat Vidyapeeth.

1.7 World Monuments Fund (WMF)

Conservationists to propose Kazhuveli watershed region for nomination to World Monuments Fund Watch 2025.

- A leading independent organization devoted to enrich people's lives and build mutual understanding across cultures and communities.
- **Established in** – 1965
- **Aim** – To conserving the world's irreplaceable treasures like architectural and cultural sites that span the history of human civilization.
- **Headquartered in** – New York, USA
- **Offices and affiliates in** – Cambodia, France, India, Peru, Portugal, Spain and the UK.
- **Partners** – Local communities, funders, and governments.
- **Work** – Preserves the world's diverse cultural heritage at more than 700 sites in 112 countries.
- **Significance** – It embraces the potential of the past to create a more resilient and inclusive society.
- It draws on heritage to address some of today's most pressing challenges like climate change, underrepresentation, imbalanced tourism, and post-crisis recovery.
- **WMF India** – It was established in 2015, under India's Companies Act, following the India's policy to include heritage conservation in corporate social responsibility programs.
- **Spearheaded by** - Maharaja Gaj Singh of Jodhpur
- **Aim** – To serve as a local representative for WMF, assisting with project management and outreach.
- World Monuments Fund began work in India in 1996 after placing the Taj Mahal on the World Monuments Watch.

World Monuments Fund Watch 2025 is a nomination-based programme that connects local heritage preservation to global awareness and action.

Kazhuveli Lake

- It is a watershed area and a part of a bird sanctuary in Villupuram district in Tamil Nadu.
- **Eri (tank) network** – A network of tanks created 1000's of years ago.

1.8 Ramakrishna Mission

Ramakrishna Mission president Swami Smaranananda passed away due to old age ailments at the age of 95.

- It is a Hindu religious and spiritual organization that is at the heart of the Ramakrishna Movement, also known as the Vedanta Movement.
- The mission was created in 1897, by Ramakrishna Paramahansa's principal follower Swami Vivekananda.
- **Ideals** – The organization primarily promotes Advaita Vedanta, a Hindu philosophy, as well as four yogic ideals: Jnana, Bhakti, Karma, and Raja yoga.
- **Math** – At Baranagar, the 1st Math was founded and another one was established in Belur in 1899, and it became the central math.
- It is responsible for the organizing and operation of all maths' located across India and even beyond the country.
- It is also the educational center for the Ramakrishna Mission's saints.

Ramakrishna Paramahansa (1836-1886)

- He was born in a Brahmana family in Bengal on 18th February 1836.
- His birth name is Gadadhar Chattopadhyaya and later came to be known as Ramakrishna Paramahansa.
- Ramakrishna dedicated his life to God and was a devotee of Goddess Kali.
- Ramakrishna was a priest in the Dakshineswar Kali Temple and attracted several monastic and householder disciples.
- Ramakrishna Paramahansa highlighted the essential unity of religions and the need to lead a spiritual life.
- He believed that the ***different religions of the world are only different ways to reach the same god.***







Swami Vivekananda (1863-1902)

- Swami Vivekananda was born in 1863 as Narendranath in a Bengali family.
- He was monk, a chief disciple of the Indian mystic Ramakrishna and the founder of Ramakrishna Mutt.
- In 1888, Narendra left the monastery and travelled extensively in India for five years.
- In 1893 Vivekananda represented India and Hinduism in ***The Parliament of the World's Religion in Chicago.***
- In 1894, he founded the ***Vedanta Society in New York*** to study, practice and propagate the principles of Vedanta.
- He was a key figure in the introduction of the Indian philosophies of Vedanta and Yoga to the Western world.
- He raised interfaith awareness, as his two favorite books being Bhagavad Gita and The Imitation of Christ and contributed to the concept of nationalism in colonial India.



1.9 Art forms in Tamil Nadu

Folk Dances	Features
Poikkaal Kuthirai Aattam	<ul style="list-style-type: none"> • It involves a dummy horse with a gap in the middle for the dancer to fit into. • It is also known as puravi attam. 
Oyillattam	<ul style="list-style-type: none"> • It tells stories from mythology, and is traditionally performed by men wearing colorful handkerchiefs tied around their fingers and ankle bells. • It is also known as the "Dance of Beauty" or the "Dance of Grace." 
Karagattam	<ul style="list-style-type: none"> • It involves balancing pots on the head while performing intricate dance movements. • The dance is performed to praise the rain goddess Mariamman. • It is a mixture of multiple forms of Tamil dance forms like Bharatanatyam postures and mudras. 
Mayilattam	<ul style="list-style-type: none"> • It is a traditional dance from south India that is performed by women in Hindu temples in Tamil Nadu and Kerala. • The dance is performed in reverence to Lord Murugan. • It is also known as the peacock dance. 

1.10 Mushk Budiji

Study unravels the recipe that gives Kashmiri rice variety, Mushk Budiji its unique aroma.

- The **Kashmir Himalaya** is known for the cultivation of mushk budiji, an indigenous rice variety distinguished for its rich aroma and unique taste.
- Mushk Budiji received a Geographical Indication (GI) tag in August 2023.

GI Rice Variety	States
Basmati Rice	Punjab, Haryana, Himachal Pradesh, Delhi, Uttarakhand, Uttar Pradesh, Jammu & Kashmir
Kala Namak Rice	Uttar Pradesh
Gobindobhog rice and Tulaipanji rice	West Bengal
Navara rice, Kaipad, Pokkali rice, Gandhakasala, Wayanad Jeerakasala and Palakkadan	Kerala
Chak-Hao rice	Manipur
Ambemohar rice and Ajara Ghansal	Maharashtra
Katarni rice	Bihar
Joha rice, Boka Chaul rice and Chokuwa rice	Assam

1.11 Puppetry and its types

The Sangeet Natak Akademi began the revival of leather puppetry, by grooming young disciples through ‘Kala Diksha’ initiative that aims at preserving traditional arts and crafts in India.

- Puppetry is a form of theatre or performance that involves the manipulation of puppets, often resembling some type of human or animal figure that are manipulated by a human called a puppeteer.
- The history of puppetry can be traced back to the **Indus Valley Civilization** in 2500 B.C. a terracotta doll with a detachable head was found by archaeologists.
- The root of Puppet is derived from the Latin word ‘Pupa’ meaning a doll.
- The earliest reference to the art of puppetry is found in Tamil classic **‘Silappadikaram’** written around the 1st or 2nd century B.C.
- Almost all types of puppets are found in India.
- **Types of Puppetry**
 - String Puppetry
 - Shadow Puppetry
 - Rod Puppetry
 - Glove Puppetry

Some of the popular versions of puppetry from all over India

NO STRINGS ATTACHED

RAJASTHAN
Kathputli (Technique: String)

UTTAR PRADESH
Glove puppets

ASSAM
Putala Natch (String)

MAHARASHTRA
Kalasutri Bahulya (String)
Chamadyache Bahulya (Shadow)

MANIPUR
Laithibi Jagoi (String)

WEST BENGAL
Putul Nautch (Rod)

KARNATAKA
Gombeyatta (String)
Togalu Gombeyaata (Shadow)

BIHAR
Yampuri (Rod)

ANDHRA PRADESH
Keelubommalatta (String)
Bommalata (Shadow)

TAMIL NADU
Bommalattam (Rod+String)

KERALA
Nool Pavakoothu (String)
Pavakoothu (Glove)

ODISHA
Gopalila Kundhei (String)
Ravanachhaya (Shadow)
Kathi Kandhe (Rod)

PUPPETRY TECHNIQUES

- String Puppets**
Jointed limbs controlled by strings
- Rod Puppets**
Large glove puppets supported by rods
- Shadow Puppets**
Operated against a white cloth screen
- Glove Puppets**
Worn on hands

Source: arthindia

Types of Puppetry							
String Puppetry	State	Shadow Puppetry	State	Rod Puppetry	State	Glove Puppetry	State
Kathputli	Rajasthan	Togalu Gombeyatta	Karnataka	Putul Nautch	West Bengal, Odisha	Pavakoothu	Kerala
Kundhei	Odisha	Tholu Bommalata	Andhra Pradesh	Yampuri	Bihar		
Gombeyatta	Karnataka	Ravanachhaya	Odisha				
Bommalattam	Tamil Nadu						

Sangeet Natak Akademi

- The Sangeet Natak Akademi is the *National Academy of Music, Dance and Drama* that was set up in 1953 as an autonomous body under the **Ministry of Culture**.
- It is the nodal agency to coordinate matters related to Intangible Cultural Heritage & other UNESCO Conventions.
- Sangeet Natak Akademi's Fellowships (Akademi RatnaSadsya) and Sangeet Natak Akademi Awards (Akademi Puraskar) are presented annually.
- The award will be given to the eminent persons from the field of tribal music, dance, theatre and traditional folk arts.
- **Kala Diksha** is a training programme that will be conducted in the Guru-Shishya Parampara Scheme under eminent Gurus and experts of rare and endangered performing art forms of the country.
- **The Guru-Shishya Parampara** Scheme aims to preserve and promote rare and vanishing art forms on classical or folk or tribal, so that the young talents be nurtured to acquire skills in their chosen field of art.

1.12 Lalit Kala Akademi (National Academy of Fine Arts)

Lalit Kala Akademi chief's powers curbed by Culture Ministry.

- It was inaugurated in New Delhi in 1954, by the then Minister for Education, Maulana Abul Kalam Azad.
- The youngest of the three Akademies founded by the Government of India, the Lalit Kala Akademi was established in pursuance of the dream of Pandit Jawaharlal Nehru for a cultural and national identity.
- The academy promotes *Indian arts both within India and outside India*.
- It is autonomous body registered under the **Societies Registration Act 1860**.
- Lalit Kala Akademi is the Government's apex cultural body in the **field of visual arts** in India.
- The Akademi is fully funded by the **Ministry of Culture**.
- **Journals** – Lalit Kala Contemporary (English), Lalit Kala Ancient (English) and Samkaleen Kala (Hindi).

1.13 Red Fort

- The Red Fort Complex was built by the Mughal Emperor **Shah Jahan**.
- It was built as the palace fort of **Shahjahanabad**, the new capital of the Mughal Emperor.
- Named for its walls of red sandstone, it is adjacent to an older fort, the Salimgarh, built by Islam Shah Suri in 1546, with which it forms the Red Fort Complex.
- The private apartments consist of a row of pavilions connected by a continuous water channel, known as the Nahr-i-Behisht (Stream of Paradise).



Red Fort was recognised UNESCO World Heritage Centre in 2007.

Mughal Architecture

- It is a building style that flourished in northern and central India under the patronage of the Mughal emperors from the mid-16th to the late 17th century.
- The Mughal period marked a striking revival of **Islamic architecture** in northern India with the fusion of Persian, Indian, and various provincial styles.
- **Features –**
 1. White marbles and red sandstones were predominantly used.
 2. Pachin Kari ornamental work and jali-latticed screens are examples of exquisite ornamentation.
 3. On all four sides of the main buildings are encircled by gardens.
 4. Mosques with huge courtyards are very popular.
 5. Calligraphic inscriptions in Persian and Arabic, containing Quranic verses.
 6. Decorative chhatris are used.

Mughal Monuments

Akbar	Jahangir	Shah Jahan	Aurangzeb
Agra Fort Great White Mosque Islamia College Peshawar Humayun's Tomb Fatehpur Sikri Tomb of Salim Chisti	Begum Shahi Mosque	Taj Mahal Wazir Khan Mosque Shalimar Gardens Shah Jahan Mosque Shahi Hammam	Badshahi Mosque Bibi ka Maqbara

Other Important Topics

Vikramaditya Vedic Clock

Prime Minister Narendra Modi recently inaugurated 'Vikramaditya Vedic Clock' in Madhya Pradesh's Ujjain city.

- 'Vikramaditya Vedic Clock' is the **world's 1st vedic clock** based on the *Indian 'panchang' (almanack)*.
- It provides information on planetary positions, Muhurat, astrological calculations, and predictions.
- In addition to this, it also indicates Indian Standard Time (IST) and Greenwich Mean Time (GMT).
- The clock will calculate time from **one sunrise to another**.
- **Ujjain** has been considered the centre of time calculation and the **Tropic of Cancer** also passes through it.

Patagonia Cave Paintings

Archaeologists have discovered the earliest dated cave paintings in Argentine Patagonia, dating back 8,200 years.

- Location- **Argentina**.
- The discovery provides evidence of the artistic ability and cultural transmission of the hunter-gatherer societies inhabited in **middle Holocene (7,000 to 5,000 years ago)**.

Gorsam Kora festival

- The Gorsam Kora festival is held **annually in Zemithang valley** (in Arunachal Pradesh, which shares its border with Bhutan) along the **Nyanmjang Chu River**.

- It is a celebration of the friendship between **India and Bhutan.**
- It features cultural performances and Buddhist rituals at the **Gorsam Chorten Stupa** dating back to the 12th century, and is older than the **Tawang monastery.**
- The Indian Army's **Gajraj Corps** is instrumental in organising the festival.

Tawang Monastery is a Buddhist monastery in the Tawang district of Arunachal Pradesh, the 2nd largest and oldest monastery in Asia, and the largest in India.

Gorkha Forts (Banasar, Malaun & Sabathu)

- Gorkha Fort situated on a small hill **Subathu** is situated in **Himachal Pradesh.**
- It is believed to be founded by the **Gurkha Army Chief Amar Singh Thapa** to fight against British, the fort today exhibits strength even through its ruins.
- It is also known as Banasar fort, Malaun fort or Sabathu fort

Tamil Isai Movement

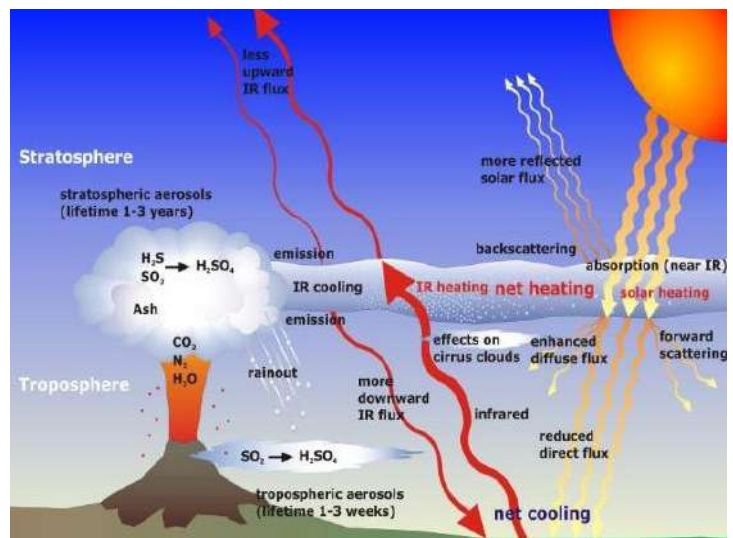
- The Tamil Isai movement is a fight to establish **Tamil as a musical language.**
- The movement began in **1939** to promote Tamil songs and give them a prominent role in music concerts, instead of making them the end result.
- The movement also aims to oppose the dominance of Sanskrit and Telugu compositions.
- It gained momentum with the establishment of Tamil Isai Sangam, which was established in **1943 by Annamalai Chettiar.**

2. GEOGRAPHY

2.1 Volcanic winter

Researchers from NASA used advanced computer modelling to simulate super-eruptions like the Toba event and found that volcanic winter would probably not exceed 1.5 degrees Celsius.

- **Volcanic winter** – A climatic cooling effect caused by large-scale volcanic eruptions.
- Previous studies agreed that some planet-wide cooling would occur and estimates have ranged from 2 to 8 degrees Celsius.
- **Occurrence** – A massive volcanic eruption can deposit enormous amounts of ascending light coloured volcanic ash and sulphur aerosols above the troposphere and into the lower stratosphere.
- **Global cooling** – These erupted particles reflect incoming solar radiation, resulting in cooler temperatures on the earth below.
- They can remain there for 2 years causing global cooling.
- The air between the troposphere and the stratosphere eventually mixes causing these particles to fall into the troposphere and wash down on the earth through precipitation.



To qualify as a **super eruption**, a volcano must release more than 1,000 cubic kms of magma. They are extremely powerful and rare. The most recent one was around 22,000 years ago in New Zealand.

- **Challenges** – The ash produced from the eruption of Mount Etna in 44 B.C. was described to have dimmed the Sun's rays and the resulting *cooling caused crops to shrivel and produce famine* in ancient Rome and Egypt.

Stratospheric Aerosols Injection (SAI) involves spraying large quantities of tiny particles like Sulphur dioxides or finely powdered calcium carbonate into the earth's stratosphere to reflect sunlight and thereby reducing Earth's temperature.

2.2 Solar Radiation Modification (SRM)

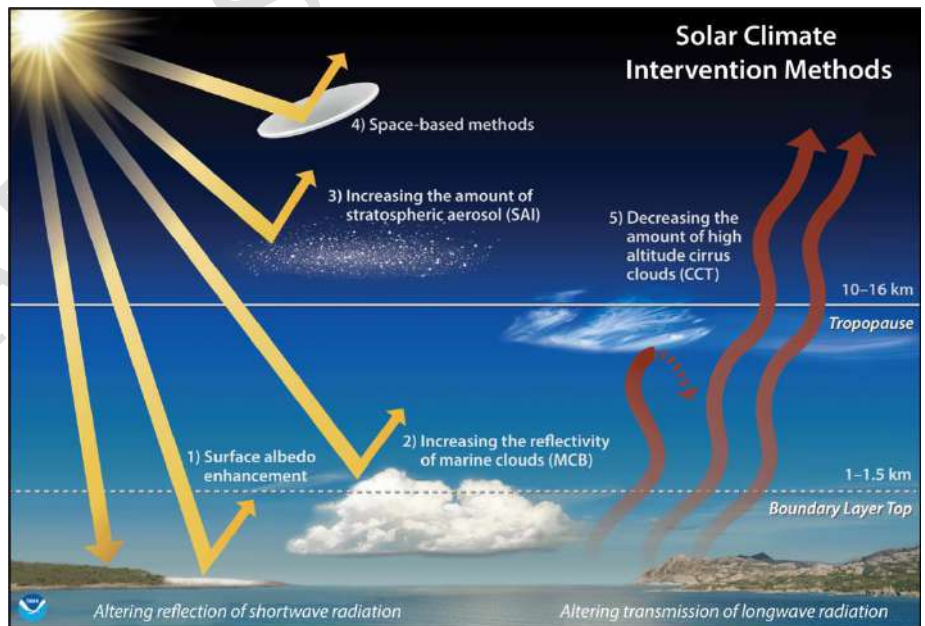
In a recent meeting, UN delegates withdrew a motion calling for more research into technologies of solar radiation modifications.

- **SRM** – It aims to address a symptom of climate change by reducing the Earth's temperature.
 - By reflecting more sunlight back into space (or)
 - By allowing more infrared radiation from Earth to escape

Solar Radiation Modification is also known as Solar Radiation Management, Radiation Modification Measures or Solar Geoengineering.

- **Need** – There is increasing risk of overshooting 1.5 degree Celsius global warming.
- **Methodologies** – It includes numerous proposed methods which differ significantly.
 - **Ground reflection** – Painting structures with reflective paints and planting crops with high reflectivity
 - **Marine Cloud Brightening (MCB)** – Spraying sea salt into low-lying clouds to increase their brightness.
 - **Stratospheric Aerosols Injection (SAI)** – Spraying large quantities of tiny particles like Sulphur dioxides or finely powdered calcium carbonate into the earth's stratosphere.
 - **Space reflection** – Placing reflectors or shields in space
 - **Exiting IR radiation** – Removing IR-absorbing clouds from the atmosphere

- **Challenges** – None of the methodologies are ready for deployment.
- There could be about possible impacts on weather patterns and agriculture, especially in poorer countries.
- It could serve as an excuse to delay cutbacks on greenhouse gas emissions.



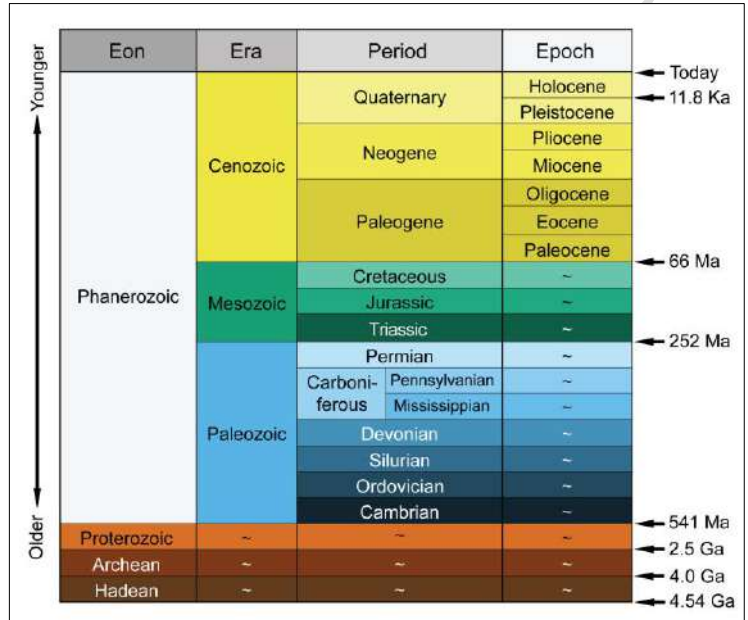
2.3 Geological Time Scale

The proposal to declare the start of the Anthropocene, a newly created epoch of the geological time scale was rejected.

- It is a fundamental scale for expressing our Earth's 4.6-billion-year history.
- **Named & classified by** – The International Commission on Stratigraphy (ICS) of International Union of Geological Sciences.
- International Chronostratigraphic Chart are the basis for the units (periods, epochs and age) of the geological time scale.

- **Criteria's used** – It uses rigorous criteria like *Earth's rock layers, or strata, and the fossils* found within them to decide when each chapter started and which characteristics defined it.
- **5 broad categories** – Eons, eras, periods, epochs, and ages (Larger to smaller).
 - **Eon** – The broadest category of geological time.
 - **Ages** – The smallest category.
- Each of these categories is further divided into sub-categories.
 - **Triassic** – It was the dawn of the dinosaurs.
 - **Paleogene** – It saw the rise of mammals.
 - **Pleistocene** – It included the last ice ages.
- **The present geological time** – Phanerozoic eon, Cenozoic era, Quaternary period, Holocene epoch and the Meghalayan age.
- *Holocene began 11,700 years ago* with the most recent retreat of the great glaciers.
- **Anthropocene** – Human civilizations are leaving unmistakable remnants in the mineral record, particularly since the mid-20th century.
 - Radionuclides from nuclear tests.
 - Plastics and industrial ash.
 - Concrete and metal pollutants.
 - Rapid greenhouse warming. Sharply increased species extinctions.

The International Union of Geological Sciences (IUGS) is founded in 1961, with 121 national members.



2.4 Sela Tunnel

Prime Minister Narendra Modi recently inaugurated the world's longest twin-lane tunnel 'Sela Tunnel' in Arunachal Pradesh.

- The Sela Tunnel is an all-weather connectivity tunnel connecting **Guwahati to the strategic Tawang sector bordering china** across Sela Pass.
- It aids faster military movement to the Line of Actual Control (LAC).
- It is built by the **Border Roads Organisation (BRO)**.
- The project comprises **2 tunnels**
 - 1st tunnel is a single-tube tunnel,
 - 2nd tunnel serves as an emergency escape route.
- The tunnel has been designed to reduce the traffic density with achieving a maximum speed of vehicles at 80 kmph.



Sela Pass is a high-altitude pass connecting Tawang with the rest of India.

2.5 Geoglyphs of Konkan Region

The Bombay High Court issued a notice to the Centre and the ASI seeking their replies on the proposed mega oil refinery in the region where prehistoric geoglyphs were found.

- They are *engraved or incised on the floor or rock bed* and are open air ensembles on the **lateritic plateaus (Sada)** of the Konkan belt.
 - **Maharashtra** - Kasheli, RundhyeTali, DevacheGothane, Barsu, Devi Hasol, Jambharun, Kudopi and Ukshi
 - **Goa** – Pansaymol

- **Time period** – More than 10,000 to 12,000 years old.
- **Themes** – Faunal themes are integral that includes marine and riverine, *mammals, reptiles, amphibian and avian life* which have vanished from the region several centuries ago.
- **Excellence in rock art** – High quality of artistic expression, with evolution of techniques (of *scooping and etching*).
 - 1 or 2 standalone figures of larger-than-life scale.
 - A composition of multiple figures, gathered for a purpose.
- Unlike Bhimbetka paintings, the incision marks and figures are more angular and less fluid.
- **Cultural significance** – Abstract anthropogenic and geometrical features together convey the interaction between man and fauna and *foundational stages of socio-sacred activities*.
- It sheds light on the *transitory phase from Stone Age to Early Historical period* of the Konkan region.
- It is a documentation of how people *adapted to ephemeral wetlands in a dry-arid plateau* having shallow rock pools, streams and watercourses.
- **Protected status** – They are classified as **protected monuments** by the state archaeology department and the Archaeological Survey of India (ASI).
- Earlier it was included in the ‘tentative list’ of UNESCO’s World Heritage List.

Petroglyph	Geoglyph
<p>A form of rock art that involves carving or pecking designs into rock surfaces.</p>  <p>Petroglyph</p>	<p>A large-scale design or motif created on the ground by removing or rearranging soil, rocks, or other natural materials.</p>  <p>Geoglyph</p>

2.6 Haiti

Haiti's top gang leader threatens politicians as fires break out in capital.

- Hayti means "**land of the mountains**" in the indigenous Taíno language.
- **Location** - Located between the **Caribbean Sea** and the North Atlantic Ocean.
- Haiti occupies the western one-third of the island of **Hispaniola** (eastern portion of Hispaniola is occupied by the Dominican Republic).
- **Bordering country** - The Dominican Republic: **Capital** - Port-au-Prince.
- **Geographic features** - Haiti has a warm, humid tropical climate.
- It is located on the leeward side of the island, which means that the influence of humid trade winds is not as great.
- **Highest peak** - Pic la Selle.
- **Political setup**- **Haiti** won independence from France in 1804, making it the second country in the Americas, after the United States, to free itself from the colonial rule.
- Haiti’s government is a **semi-presidential republic**, with a President acting as the country’s leader and a Prime Minister reporting to the president.



Haiti became the world's 1st black-led republic and the 1st independent Caribbean state when it threw off French colonial control and slavery in the 19th century.

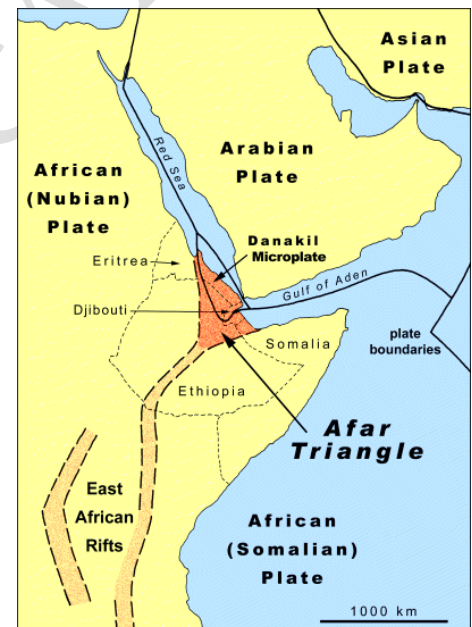
Windward Passage - Between Hispaniola and Cuba

- **Ethnic Groups** - Nearly all of Haiti's population are of African origin.
- A small minority of people of mixed European & African descent (called mulattoes) constitute a wealthier elite.

2.7 Afar Triangle

Geologists have found a fault that can create world's sixth ocean.

- **Afar Region** – Located in Northern Ethiopia as a part of the Great African rift system.
- **Afar Triple Junction** – Located along a divergent plate boundary dividing the Nubian, Somali, and Arabian plates.
- Here, the Red Sea Rift meets the Aden Ridge and the East African Rift and the connecting three arms form a triple junction.
- **Afar Triangle** – The southern rifting arm is known as the East African Rift or the East African Rift System which includes the Afar Triangle.
- **Tectonics of the Afar triple junction** - The Arabian Plate is rifting away from the African plate along an active divergent plate ridge system. This formed the Red Sea and the Gulf of Aden.
- In time, as the Nubian and Somalian plates move further away from each other, the area between them will grow thinner and drop below sea level.
- New ocean lithosphere may form along the centre of the rift, producing a new narrow ocean basin with the mid-ocean ridge.
- Consequently, this part of East Africa would evolve into its own distinct continent.
- **Afar Depression** - It is geological depression formed as the product of a tectonic triple-rift junction.
- Location - Horn of Africa
- Also known as - Afar Depression or Danakil Depression or Denakil Plain
- Features - The Afar Depression includes the
 - **Danakil Desert**
 - **Lake Asal** (the lowest point in Africa which is less than 155 meters below sea level)
 - **Dallol** in Ethiopia (one of the hottest places year-round anywhere on Earth).
- The only river that flows into the Depression is the Awash River.



2.8 Kshipra River

A performance audit conducted by the Comptroller and Auditor General of India (CAG) on the degradation of the river, covering 2016-17 to 2020-21, threw up a host of significant findings.

- The Shipra, also known as the Kshipra, is a river in the State of **Madhya Pradesh**.
- The river rises in the kakri bardi hills Vindhya Range north of Dhar, and flows north across the Malwa Plateau to join the Chambal River.
- Shipra is a perennial river and is considered as sacred as the Ganga River by the Hindus.
- The Shipra River finds mention not only in ancient Hindu texts, but also in Buddhist and Jain scriptures.
- The pious river Kshipra is often referred to as "**Lok Sarita**" or the river of masses since, its origin is directly out of the womb of the earth.
- The holy city of **Ujjain** is located on the right bank of the Shipra River.
- The famous **Kumbha Mela** takes place in the Ghats of this city, once every 12 years, a yearly celebration of the river goddess Kshipra.

2.9 Netravati Waterfront Promenade Project

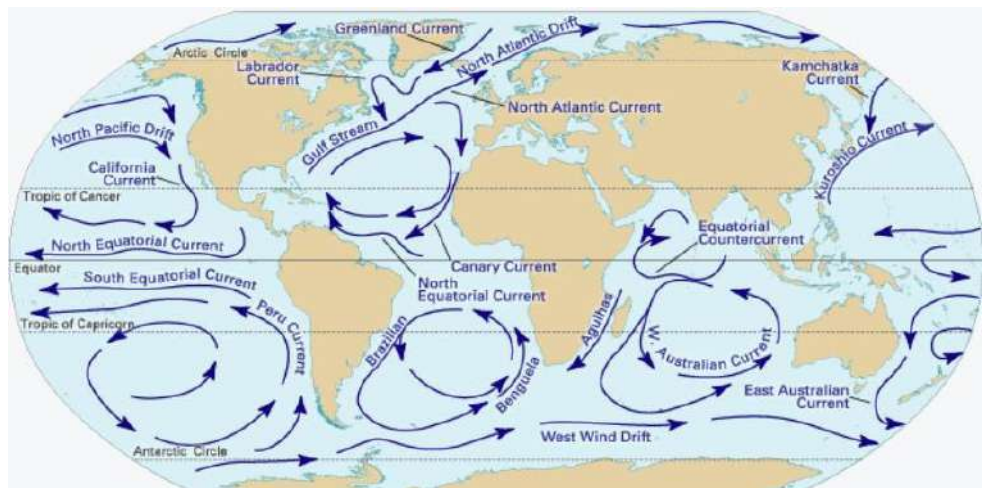
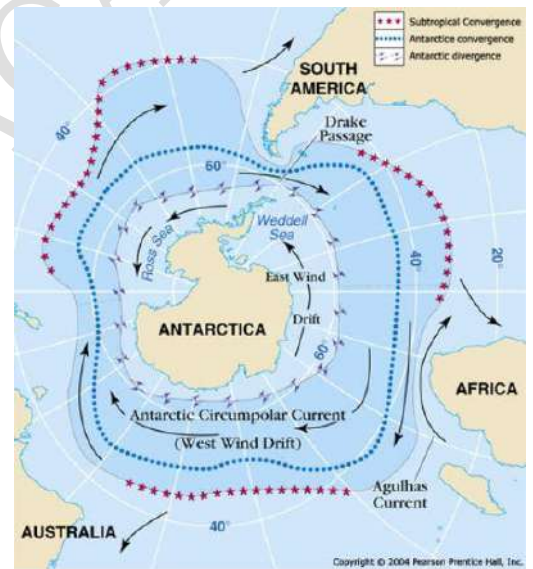
National Green Tribunal (NGT) in New Delhi has recently initiated action on the Netravati Waterfront Promenade Development Project in Mangaluru, Karnataka.

- The project is implemented by **Mangaluru Smart City Limited (MSCL)**, a special-purpose vehicle created under the Union Government's Smart City Mission.
- The Project has been in controversy due to alleged violations of Coastal Regulation Zone (CRZ) norms and environmental regulations.
- Furthermore, there is no environmental impact assessment (EIA) report prepared for this project.
- **Netravati River** - The Netravati River, also known as the Bantwal River originates in the **Bangrabalige valley of Yelaneeru Ghat** in Karnataka.
- It joins the **Kumaradhara River** before emptying into the Arabian Sea.
- The Netravati is considered one of India's holy rivers and flows through the famous **pilgrimage site of Dharmasthala**.

2.10 Antarctic Circumpolar Current (ACC)

Scientists reconstruct history of world's most powerful ocean current over last 5.3 million years and its link to global climate.

- Antarctica is surrounded by the **Southern Ocean**.
- **Southern Ocean** – **Southern Ocean** is an unbroken body of water with a rushing current that both isolates Antarctica's coastal ocean and provides essential chemical nutrients for the Antarctic ecosystem.
- **ACC** – The **Antarctic Circumpolar Current (ACC)** is the largest wind-driven current on Earth.
- It is the only current that goes all the way around our planet and connects the Atlantic, Pacific, and Indian Oceans.
- It is driven by strong westerly winds and was discovered by Edmund Halley.
- The ACC is a massive flow of water that acts as a barrier separating the Southern Ocean from more northern oceans.
- **World Circulation** – Antarctica is also the place where waters form that flow through the deep ocean as part of the **Global Ocean Conveyor** (World Circulation).
 - The global ocean conveyor belt is a constantly moving system of deep-ocean circulation driven by temperature and salinity.
- Water that **flows at the bottom of the ocean** is formed on the Antarctic continental shelf, particularly in the Weddell Sea and the Ross Sea.
- Different weather conditions a little further north at 45-55 degree south causes another water mass, called **Antarctic Intermediate Water** to form.
- In this area, precipitation is greater than evaporation, so the salinity of the water is low.



Ocean Currents

- They are made up of horizontal and vertical components of the circulation system of ocean waters that is produced by gravity, wind friction, and water density variation in different parts of the ocean.
- They are similar to winds in the atmosphere that transfer significant amounts of heat from Earth's equatorial areas to the poles and thus play important roles in determining the climates of coastal regions.
- In addition, ocean currents and atmospheric circulation influence one another.

Surface Currents

- Large-scale surface ocean currents are driven by global wind systems that are fueled by energy from the sun.
- These currents transfer heat from the tropics to the Polar Regions, influencing local and global climate.
- The warm Gulf Stream originating in the tropical Caribbean, for instance, carries about 150 times more water than the Amazon River.
- The current moves along the U.S. East Coast across the Atlantic Ocean towards Europe.
- The heat from the Gulf Stream keeps much of Northern Europe significantly warmer than other places equally as far north.

Deep Ocean Currents

- Differences in water density, resulting from the variability of water temperature and salinity, also cause ocean currents.
- This process is known as thermohaline circulation.
- In cold regions, ocean water loses heat to the atmosphere and becomes cold and dense.
- When ocean water freezes, forming sea ice, salt is left behind causing surrounding seawater to become saltier and denser.
- Surface water flows in to replace the sinking water, which in turn becomes cold and salty enough to sink.
- This global set of ocean currents is a critical part of Earth's climate system as well as the ocean nutrient and carbon dioxide cycles.

Other Important Topics

Salma Dam

- It is a **hydroelectric power project** that built on the **Hari River** in **Afghanistan's** Herat province.
- It was funded by the Indian government and officially known as **India-Afghanistan Friendship Dam**.

Artificial Glaciers in Tian-Shan mountains

- In the Tian-Shan mountains of **Kyrgyzstan**, villagers have made an artificial glacier to provide water for their drought-hit farms.
- The water comes through underground piping from a mountain source gushes out and freezes, forming a glacier.
- Artificial glaciers were 1st created in the **Indian Himalayas** in **2014** and have gone global.

Geothermal blanket

*Venezuela has embarked a project to preserve its final glacier, **La Corona**, by deploying a geothermal blanket recently.*

- Project - Covering the area with a thermal mesh made of polypropylene plastic warding off the Sun's rays.
- The blankets use the temperature of the earth to moderate the temperature inside the sealed blankets.
- **Disadvantages** - Micro plastics in the blanket will end up in the soil and could harm rare species of mosses and lichens and hummingbirds.
- **Venezuela** is the first country in the Andes Mountain to lose all its glaciers.

Dege Hydropower Dam Project

- The Dege hydropower dam project is part of **China's 1 reservoir, 13 hydropower-station complex project** on the **Drichu River in Tibet**.
- The **Drichu River**, also known as Yangtse River, is the **longest river in China and the 3rd longest river in the world**.

Sharavathi pumped storage project

- It is a proposed hydro project in **Karnataka** that aims to increase power generation.
- The project is expected to use the existing **Talakalale and Gerusoppa reservoirs** to generate **2,000 MW** of power and could take **5 years** to implement.
- **Sharavathi river**, originating at Ambutirthha mountain in **Karnataka**, is a westward flowing river.
- The river forms the famous **Jog Falls** before joining the Arabian Sea at Honavara.

Phani Yerava tribe

- The Phani Yerava tribe live in the Makuta village, which falls under the Makuta Aranya Valaya, in Kerti reserved forest of **Karnataka's Western Ghats**.
- The tribes secured land rights under the Forest Rights Act in 2021.
- **Kerti Reserved Forest** is part of a World Heritage site in India and is located in Coorg, Karnataka.

Taljai hill

Residents of Taljai hill have submitted a letter to the forest department, demanding an explanation about the activities going on in the area.

- Taljai Hills is developed as a park, is a designated wildlife reserve.
- It is part of the **Western Ghats in Pune**.
- It is named after the temple of **Taljai Mata Devi**, which is located atop the hill.

Coral Superhighway

Scientists have discovered that remote coral reefs around the Seychelles are closely related through ocean currents creating a coral superhighway.

- Coral superhighway is a network of ocean currents that transports huge quantities of coral larvae between these scattered islands.
- A key factor in reef recovery is larval supply, making the discovery important in future coral restoration projects.



Sabroom Land Port

Prime Minister has recently inaugurate the 3rd land port in Sabroom, Tripura

- It is a strategically located in **Tripura** along the international border between **India and Bangladesh**.
- It will be constructed by the **Land ports authority of India**.
- It is directly connected to **Chittagong port of Bangladesh** through **Maitree bridge on River Feni**.
- **Land ports** is an area on an international border that includes parts of highways, railways, and other roads.

Lamphelpat Lake

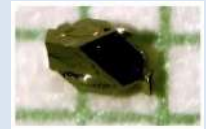
Lamphelpat Lake is now undergoing a remarkable revival under Lamphelpat Waterbody Project.

- **Lamphelpat** - A natural lake **in Manipur** located in the foothills of the Langol hill range.
- It served as a reservoir, storing excess water of the Luwangli and Nambul rivers.
- It is considered a **mini Loktak lake** that maintains the ecosystem of Imphal and its surrounding areas.
- **Loktak Lake** – Located in Manipur, it is the largest freshwater lake in Northeast India
- **Lamphelpat Waterbody Project** - Initiated by the Manipur Water Resource Department in collaboration with the Ministry of Jal Shakti.

Miassite (Rh17S15)

Scientists have recently identified the 1stunconventional superconductor, Miassite that can be found in mineral form in nature.

- Miassite is one of only 4 minerals found in nature that act as a superconductor when grown in the lab.
- It is an **unconventional superconductor** with properties similar to high-temperature superconductors.
- **Superconductivity** is when a material can conduct electricity without energy loss.
- **London penetration depth test** was used to identify the type of superconductivity present in miassite.



Darien Gap

A record 520,000 people crossed the Darien Gap in 2023.

- It is a stretch of densely forested jungle across **northern Colombia and southern Panama** around the Gulf of Urabá.
- It forms the physiographic link between **Central & South America**.
- It is a hot, humid area typified by tropical rainforests, mangrove swamps, and low mountain ranges with cloud forest vegetation.
- No paved roads exist in the Darien Gap but it has become a major route for global human migration.
- The Missing Migrant Project reported 141 known deaths in the Darien Gap in 2023.
- **Darien National Park in Panama and Los Katios National Park** in Colombia finds mention in the UNESCO World Heritage List.



Gulf of Tonkin

- The Gulf of Tonkin is a crescent-shaped body of water in the northwestern part of the **South China Sea**.
- The gulf is bordered by **Vietnam in the west and northwest** and by **China in the north and Leizhou Peninsula and Hainan Island in the east**.
- Many rivers empty into the Gulf of Tonkin, with the Red River (Yuan River in Chinese) supplying the major riverine discharge.
- Hainan Strait separates the principal shipping route between **Hainan Island and China's Leizhou Peninsula**.



Turahalli forest

- Turahalli is a deciduous shrub forest located in Bengaluru, **Karnataka**.

Byadagi chillies

- Byadagi chillies are a type of chili that are primarily grown in **Karnataka, India**.
- Byadagi chillies are **hotter than Kashmiri** chillies but milder than the Guntur variety.
- **Primary varieties - Byadgi Kaddi & Byadgi Dabbi**
- These 2 chilli varieties were granted the Geographical Indication (**GI**) tag in **2011**.

Malawi

The southern African nation of Malawi has recently declared a state of disaster over drought in 23 of its 28 districts.

- Malawi is a **landlocked country in southeastern Africa**.
- It is bordered by Zambia, Tanzania, and Mozambique.
- The **East African Rift Valley** runs through the country from north to south.
- The Great Rift Valley splits the highlands, and the southern end of Lake Malawi is in Lake Malawi National Park.



Senegal

Senegal's Bassirou Diomaye Faye appears to have won the recent presidential election.

- Senegal is a **West African country** with **Dakar** as its capital.
- Senegal is crossed by 3 westbound rivers - Senegal River, Gambia River, Casamance River.
- Senegal is known as the **Gateway to Africa**.
- The country lies at an ecological boundary where semiarid grassland, oceanfront, and tropical rainforest converge.
- The Cape Verde (Cap Vert) Peninsula is the westernmost point of the African continent.



Magnetofossils

Scientists have discovered a 50,000-year-old sediment, a giant and one of the youngest magnetofossil in the Bay of Bengal.

- Magnetofossils are the fossilised remains of magnetic particles created by **magnetotactic bacteria**.
- They are found preserved within the geological records, a standard time scale that partitions the Earth's history into four eons and their subdivision of eras, periods, and epochs.

Magnetotactic bacteria

- These bacterias are mostly **prokaryotic organisms** that arrange themselves along the earth's magnetic field to reach places that had optimal oxygen concentration.
- These magnetotactic bacteria create tiny crystals made of the iron-rich minerals magnetite or greigite.

'Meghayan-24'

'Meghayan-24', seminar was conducted recently as part of the World Meteorological Day (March 23).

- It is a **METOC (Meteorological and Oceanographic) seminar** to share knowledge & insights on weather and climate services as well as way ahead to face the challenges of climate change.
- **Conducted by** – School of Naval Oceanology & Meteorology (SNOM) and Indian Naval Meteorological Analysis Centre (INMAC).

INDRA (Indian Naval Dynamic Resource for Weather Analysis)

- **Aim** - It is an indigenous mobile application to disseminate weather related information and forecasts.
- **Developed by** - BISAG (Bhaskaracharya National Institute for Space Applications and Geo-informatics) in coordination with Directorate of Naval Oceanology and Meteorology, Indian Navy.

South East Africa Montane Archipelago (SEAMA)

A recent study has unearthed a wealth of previously undocumented biodiversity in a newly recognised ecoregion called the South East Africa Montane Archipelago (SEAMA).

- SEAMA is a newly discovered mountainous region stretches across **northern Mozambique to Mount Mulanje in Malawi**, southern Africa's 2nd highest mountain.
- SEAMA has distinctly **higher annual rainfall and humidity**, especially in the dry season, compared to surrounding regions.

3. POLITY

3.1 Rajya Sabha Elections

In a recent ruling, the Supreme Court said that the elections to the Rajya Sabha required 'utmost protection' and the right to vote should be carried out freely without fear.

- **Rajya Sabha** – It is the *Upper House* of the Indian Parliament, also called as *Council of States*
- **Qualification** – **Article 84** of the Constitution lays down that
 - He/ She must be a citizen of India
 - He/ She must be not less than 30 years of age
 - He/ She must possess such other qualifications as may be prescribed in that behalf by or under any law made by Parliament.
- **Election** – Members are elected by the method of *indirect election* in accordance with the system of *proportional representation by means of the single transferable vote*.
- **Electoral College** – *Elected members* of the Legislative Assembly of all the States.
- Elected members of the legislative assembly of *UT of Puducherry, Jammu & Kashmir and National Capital Territory of Delhi*.
- Rajya Sabha being a permanent house is not subject to dissolution. However one-third Members retire after every 2nd year.
- A member who is elected for a full term serves for a period of 6 years and on the expiration of this term retires from the membership.
- **Biennial/Bye-election** – It is the election, to fill a vacancy arising otherwise than by retirement of a member.
- Vacancy may be due to either resignation or death or disqualification of members under the 10th Schedule.
- A member elected in a bye-election remains a member only for the remainder of the term of the member.
- **Supreme Court** – It declared that Rajya Sabha elections are within the remit of Article 194(2) of the Constitution, clarifying its 2006 Kuldip Nayar judgment.
- Parliamentary privileges under **Articles 105(2) and 194(2)** extends to other powers of elected members taking place in the legislative body even when the house is not in session.
- Thus the members of parliament and legislative assemblies *cannot claim immunity* from prosecution on *charges of bribery related to votes or speeches* in the legislature.

Article 80 of the Constitution lays down the maximum strength of Rajya Sabha as 250, where 12 members are nominated by the President and 238 are representatives of the States and of the 3 Union Territories.

In **2006 kuldip Nayar case**, Supreme Court ruled that Rajya Sabha elections were not proceedings of legislature within the meaning of Article 194 but a mere exercise of franchise.

Rajya Sabha Provisions	Borrowed from the Constitution of
Elections	South Africa
Nomination of Members by President	Ireland

3.2 Office of a Judge of a High Court

A sitting judge of a Calcutta High court announced his resignation in order to join politics reflects the challenges associated with independence of Judiciary.

- **Article 217** in Constitution of India mentions about the appointment and conditions of the office of a Judge of a High Court.
- **Qualification** – A person shall not be qualified for appointment as a Judge of a High Court unless he is a citizen of India and
 - Has for at least 10 years held a judicial office in the territory of India or has for at least 10 years been an advocate of a High Court or of 2 or more such Courts in succession
- **Appointed by** – The President, by warrant under his hand and seal.
- **Tenure** – Until he attains **62 years of age**.
- If any question arises regarding the age, it shall be decided by the President after consultation with the Chief Justice of India and the decision of the President shall be final.
- **Vacation of seats** – A Judge can *resign* by writing under his hand a letter addressed to the President.
- A Judge may be *removed* from his office by the President in the manner provided in clause (4) of article 124 for the removal of a Judge of the Supreme Court.
- In case of being appointed by the President to be a *Judge of the Supreme Court* or by his being *transferred* by the President to any other High Court within the territory of India.
- **Post-retirement appointments** – Under **Article 224A** of the Constitution, the Chief Justice of a High Court may at any time, with the previous consent of the President, request any person who has held the office of a Judge of that court or of any other High Court to sit and act as an *Ad-hoc judge of the High Court* of that State.
- **Concerns** – Out of 28 judges who have retired in the last half-decade, 6 judges have been granted constitutional or statutory appointments.
- In 2023, Supreme Court Dismissed the PIL Seeking 2 Years' Cooling Off Period For Retired Judges' [Post-Retirement Appointments](#).

The practice of placing retired Supreme Court judges started with 1st Chief Justice of India, Saiyyad Faizal Ali, being appointed as governor of Orissa after his stint as an ad-hoc judge under Article 128.

The 14th Law Commission Report (1958) recommended that judges should be **barred** from accepting employment with the Union or the state, as a post retirement job.

3.3 Citizenship – Union List

Chief Ministers of Tamil Nadu, Kerala and West Bengal objected to implementation of Citizenship (Amendment) Act, 2019 (CAA).

- **Citizenship** – It is the status of a person recognized under law as being a legal member of a sovereign state or belonging to a nation.
- **Indian Constitution – Articles 5 – 11** of the Constitution deals with the concept of citizenship.
- It entails the enjoyment of full membership of any State in which a citizen has civil and political rights.
- **Power of Union government** – It is entitled with *granting of citizenship*.
- 'Citizenship, naturalisation and aliens' figuring as entry no. 17 in the **union list under the 7th Schedule**.
- **Article 256 of the Constitution** – It talks about 'Obligation of States and the Union'.

Citizenship (Amendment) Act, 2019 aims to offers citizenship to persecuted non-Muslim minorities from Muslim-majority Pakistan, Afghanistan, and Bangladesh.

- The executive power of every state shall be so exercised as to ensure *compliance with the laws made by Parliament* and any existing laws which apply in that state.
- The executive power of the Union shall extend to the giving of such *directions to a state* as may appear to the government of India to be necessary for that purpose.
- **Limited power of States** – It would have *no other option but to implement* the law passed by the Parliament.
- **CAA Rules, 2024** – It envisages district level committee and state/UT level committee (Empowered committee), to verify documentation and take a final call on citizenship.
- Both committees are packed with central government officers and *state/UT concerned is represented by a sole invitee* to each committee.
- The Chair of both the committee are central government officers.
- Since the quorum of both committees shall be 2 including the chair, it means the committees *can do complete work without mandatorily involving the state representatives*.

The 7th Schedule has 3 lists namely, the Union list, state list, and concurrent list that show the division of power between the Union and States concerning certain subjects.

3.4 Lokpal

Former Supreme Court Judge Ajay Manikrao Khanwilkar was administered the oath of office as the Lokpal chairperson by the President recently.

- The Lokpal is an **independent statutory body**, or body of ombudsman, that has jurisdiction over the **central government to investigate allegations of corruption against public officials** including the Prime Minister.
- The Lokpal was recommended by the Administrative Reforms Commission (ARC) of India, established under the **Lokpal and Lokayuktas Act 2013**.

Ombudsman is a Swedish term which means a person who is authorised to act for someone else.

LokPal	Lokayukta
It has jurisdiction to investigate public officials in Union level	It has jurisdiction to investigate public officials in state level.

- **Appointment** - Lokpal would be appointed by the **President** after consultation with the *Chief Justice of India*, the *Speaker of Lok Sabha* and the *Chairman of the Rajya Sabha*.
- **Members** - The Lokpal to consist of a Chairperson with a maximum of **8 members** of which **50% shall be judicial members**.
- **Power** - The Lokpal will have the power of superintendence and direction over any investigating agency, including the CBI, for cases referred to them by the Lokpal.
- **Report** - The Lokpal is required to present **annually to the President** a report on the work done by it, which is caused to be laid in **both the Houses** of the Parliament.

3.5 Model Code of Conduct (MCC)

Model Code of Conduct comes into force for 2024 Lok Sabha elections.

- **Guidelines** – The MCC of the [Election Commission of India \(ECI\)](#) is a set of guidelines issued to regulate political parties and candidates prior to elections.
- **Rules** – The rules range from issues related to speeches, polling day, polling booths, portfolios, the content of election manifestos, processions, and general conduct, so that free and fair elections are conducted.
- **Comes into Force** – The [MCC](#) comes into force from the date the election schedule is announced until the date that results are out.
- **Provisions** – The [MCC](#) contains eight provisions dealing with general conduct, meetings, processions, polling day, polling booths, observers, the party in power, and election manifestos.
- **Restrictions** – Parties in both centre and state, should ensure that it does not use its official position for campaigning.

- No policy, project or scheme can be announced that can influence the voting behaviour.
- No advertising at the cost of the public exchequer or using official mass media for publicity on achievements to improve chances of victory in the elections.
- Ministers must not combine official visits with election work or use official machinery for the same.
- Ruling party cannot use government transport or machinery for campaigning.
- Ruling government cannot make any ad-hoc appointments in government, public sector undertakings etc., which may influence the voters.
- Political parties can be criticised based only on their work record and no caste and communal sentiments can be used to lure voters.
- Mosques, Churches, Temples or any other places of worship should not be used for election campaigns.
- Bribing, intimidating or impersonation of voters is also barred.
- **Election Silence** – Holding public meetings **during the 48-hour period before the hour fixed for the closing of the poll** is also prohibited. The 48-hour period is known as election silence.
- It has **no statutory backing**, meaning anybody breaching the **MCC** cannot be proceeded against under any clause of the Code. Everything is **voluntary**.
- The **ECI** can issue a notice to a politician or a party for an alleged breach of the MCC either on its own or based on a complaint by another party or individual.
- Once a notice is issued, the person or party must reply in writing, either accepting fault and tendering an unconditional apology or rebutting the allegation.

3.6 Impeachment of the President in the USA and India

The impeachment inquiry into President Joe Biden has hit crossroads, lacking the political support.

- The term impeachment is derived from old French empeecheier meaning to hinder or impede.
- Impeachment refers to the act of formally accusing a public official of a serious offence in connection with their job.
- In India, Impeachment itself results in removal of the President from his office while an impeachment is regarded as an indictment in the US.
- The Impeachment Procedure of President in the US and India is both borrowed from the fundamental idea of impeachment of Great Britain. However, they differ from each other, both procedurally as well as substantially.

The first recognised case of impeachment dates back to 1376 in England.

Impeachment Procedure of President in US	Impeachment Procedure of President in India
<ul style="list-style-type: none"> • Head of State – The President of the United States of America is the head of the state and the head of the Government of the United States of America. • Article II – Article II of the US Constitution, provides for the establishment of the executive branch of the US Government and vests the executive power upon the President. • Impeachment – Section 4 of Article II of the Constitution provides for impeachment of the President on grounds of treason, bribery, or other high crimes and misdemeanours. • In the United States, an impeachment does not result in removal from the office. • It is the first step, which if followed by a conviction, results in removal from the office. 	<ul style="list-style-type: none"> • Head of State – The President of India is officially known as the President of the Republic of India and is the Head of the State. • Article – The only condition for impeachment of the President in India is “violation of the constitution” as per Article 56 (1) (b) of the Constitution of India. • Impeachment – However, the words violation of the constitution don’t find their definition anywhere in the Constitution. • Article 61 further provides for the procedure of impeachment of President. • Initiated by – Accordingly, impeachment proceedings against the President can be initiated by either of the houses, provided that the charges are signed by at least 1/4 of the members of that house. • Thereafter, a 14 days’ notice is served to the president.

<ul style="list-style-type: none">• If the House passes the Articles of Impeachment by a simple majority, the President stands impeached.• The indictments are then forwarded to the Senate for trial.• The Senate Trial is presided over by the Chief Justice of the US Supreme Court.• Trial – During these trials, the President can appear himself or be represented by a Representative.• Majority – A Conviction in the Senate Trial requires a supermajority of 2/3rd of the present and voting and it is upon Conviction that the President stands removed from the Office.• Reasons – A US President can be impeached for "Treason, Bribery, or other high Crimes and Misdemeanours".• A total of three Presidents, namely Andrew Johnson, Bill Clinton and Donald Trump, have been impeached so far.	<ul style="list-style-type: none">• Then the resolution is voted upon in the house, and requires a special majority of not less than two thirds of the total membership of the House.• It is then sent to the other house which investigates upon the charges.• Trial – Such a trial is presided over by the presiding officer of the house in which the charges are to be investigated.• Article 61 (3) of the Constitution gives the President the right to appear himself and to be represented during the investigation of charges, based on the principle of Audi alterum partum.• Majority – If a resolution is passed by a special majority of at least 2/3rd of the total membership of the investigating House, it would result in removal of the President from his office from the date of passing of the resolution.• Till date the provision for impeachment of the President has never been used.
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3.7 Arresting the Chief Ministers

Delhi Chief Minister Aravind Kejriwal was recently arrested by the Enforcement Directorate (ED) in an excise policy case linked money laundering case

- **Representation of People's Act, 1951**- It outlines disqualification provisions for certain offences, but a conviction is a prerequisite for anyone holding the office.
- **Disqualification**- The Act says that a person convicted for an offence and sentenced to *2 years or above* shall be disqualified from the date of such conviction.
- **Electoral disqualification**- It says the lawmaker shall continue to be disqualified for a further period of *6 years* after his release.
- **Article 361**- President and Governor enjoy constitutional immunity from civil and criminal proceedings until the completion of their term.
- This immunity **does not extend to Prime Ministers or Chief Ministers**, as they are regarded as equals under the Constitution's principle of the Right to Equality before the law.
- Despite this, they are not automatically disqualified solely by virtue of an arrest.
- **Delhi framework**- Delhi is a Union Territory not a State, it operates under a [unique constitutional framework](#) outlined in Articles 239 AA and 239 AB of the Indian Constitution.
- **Article 239 AB**- The Lieutenant Governor can seek Presidential intervention potentially leading to the imposition of President's rule.
- **S. Ramachandran versus vs Senthil Balaji**- The Madras High Court delved into the ethical and moral considerations surrounding a minister's right to hold office who is accused in 'cash for jobs scam'.
- The Court referred *Manoj Narula vs Union of India case 2014*, which had held that the basic norm for holding a public office was constitutional morality, good governance and constitutional trust.
- The Madras High Court had agreed that citizens expect, and "legitimately so", that persons in power had high standards of moral conduct. It had described the role of a Chief Minister as "the repository of the people's faith".

3.8 Predicate Offence

The Delhi CM Kejriwal in Delhi excise policy case can be booked for the offence of laundering proceeds of crime derived from the case.

- According to PMLA, money laundering is defined as:

- Whosoever directly or indirectly attempts to indulge in any process connected with the proceeds of crime, including its concealment, possession, acquisition shall be guilty of offence of money laundering.
- Proceeds of crime is any property derived directly or indirectly, by any person as a result of criminal activity relating to a scheduled offence.
- The law also defines scheduled offences, which are listed in two schedules attached to the PMLA.
- These acts in the schedules (scheduled acts) are also called predicate offences.
- **Predicate offence** - Predicate offenses in money laundering refers to a crime component of a larger crime (money laundering or financing of terrorism).
- In a financial context, the predicate offense would be any crime that generates monetary proceeds.

3.9 Postal Ballot Voting

The Election Commission of India (ECI) announced that media persons covering polling day activities are now eligible to vote in the upcoming Lok Sabha elections 2024 and state Assembly polls through postal ballots.

- The [ECI](#) has provisions for allowing its citizens to cast vote during an election in three different ways: In person, by post, and through a proxy.
- While in-person voting obviously involves the voter to be physically present at the polling booth, the other two allows certain voters to exercise their Right to Adult Franchise from a distance.
- **Postal ballots** – They are also known as [mail-in ballots](#), allow registered voters to cast their votes by mail instead of physically going to a polling station.
- The system is an alternative for individuals unable to [vote in person](#) due to reasons, such as being away from their constituency, disability, or performing essential services on Election Day.
- **Eligibility** – Eligible electors who can opt to vote through postal ballots include:
 1. **Service voters** – Members of the armed forces, paramilitary forces, and government employees deployed on election duty far from their home constituencies.
 2. **Absentee voters** – Individuals unable to vote in person due to reasons like work commitments, illness, or disability.
 3. **Electors on election duty** – Government officials and polling staff assigned duties at polling stations other than their own.
 4. **Electors under preventive detention** – Individuals detained under preventive custody orders during the election period.
 5. **Essential services covering polling day activities** – Media persons with authorization letters from the EC and those involved in essential services such as metros, railways, and healthcare have the option to vote using postal ballots in Lok Sabha and four state Assembly polls.
- **Process** – The process of casting the postal vote is as follows:
 1. Receiving the postal ballot
 2. Marking the ballot
 3. Completing the declaration form
 4. Sealing the envelope
 5. Returning the postal
- **Counting** – Postal ballots are counted separately from votes cast at polling stations.

In 2019, the Ministry of Law and Justice amended the Conduct of Election Rules, 1961, lowered the age from 85 to 80 and allowed Persons with Disabilities (PwDs) to cast votes through postal ballots in 2020 Delhi Assembly polls.

Other Important Topics

Commission on the Status of Women (CSW)

Pune's Dr Eeshani Bendale will join the United Nations Women UK Commission on the Status of Women as a delegate.

- The Commission on the Status of Women (CSW) is the **principal global intergovernmental body** exclusively dedicated to the promotion of gender equality and the empowerment of women.
- It is a functional commission of the Economic and Social Council (ECOSOC) established by UN Economic and Social Council resolution of 1946.
- **Secretariat** - UN Women.
- CSW membership comprises **45 States** elected by ECOSOC on the basis of equitable geographical distribution.
- India was elected to the CSW for **4 years** from 2021 to 2025.

Nomination of members to Rajya Sabha

Ms. Sudha Murty was recently nominated as the member of Rajya Sabha by President Droupadi Murmu.

- The President of India nominates **12 members** to the [Rajya Sabha](#) for a **6-year term**.
- The nominees must have special knowledge or practical experience in **art, literature, science, and social service**.
- Nominated members of Rajya Sabha have a right to vote in the election of the Vice-President of India, they are **not entitled to vote in the election of the President of India**.

Sham elections

Vladimir Putin was recently elected as President for a 5th presidential term.

- Sham elections refer to elections that are held without any purpose or significance **purely for show**.
- They are common in dictatorial regimes that still feel the need to establish some element of public legitimacy.
- Ballots in a show election may contain only one "yes" option. Where there are "yes or no" questions, people who pick "no" are often prosecuted, thus making the "yes" choice the only option.

4. GOVERNMENT INTERVENTIONS & SCHEMES

4.1 National Urban Co-operative Finance and Development Corporation Limited (NUCFDC)

Union Home Minister and Minister of Cooperation will launch National Urban Co-operative Finance and Development Corporation Limited (NUCFDC).

- **NUCFDC** – It will be the Umbrella organization for the Urban Cooperative Banks (UCB).
- **Objectives** – To modernize and strengthen the Urban Cooperative Banking Sector in India, ultimately benefiting both the banks and their customers
- To facilitate communication between banks and regulators, and address challenges faced by Urban Cooperative Banks.
- It aims to raise capital of Rs.300 crores.
- **Working** – It has received Certificate of Registration from the RBI to operate as a Non-Banking Finance Company (NBFC).
- It will also be allowed to operate as a Self-Regulatory Organization (SRO) for the sector.
- **Services** – Apart from offering liquidity and capital support, it would set up a technology platform that can be shared by all UCBs, to widen their range of services at a relatively lower cost.
- It can also offer fund management and other consultancy services.

Urban Cooperative Banks (UCB) in India

- Refers to primary cooperative banks located in urban and semi-urban areas.
- These banks, till 1996, were allowed to lend money only for non-agricultural purposes. This distinction does not hold today.
- **Regulation** – By the States Cooperative Societies Act
- The Banking Regulations Act of 1949 and the Banking Laws (Co-operative Societies) Act of 1955 also place them under the control of Reserve Bank of India (RBI).
- **Current scenario** – There are over 1,500 scheduled and non-scheduled UCB with a total number of branches exceeding 11,000.

4.2 UNNATI – 2024

The Union Cabinet have approved the new industrial development scheme, Uttar Poorva Transformative Industrialization Scheme, 2024 (UNNATI – 2024).

- It is *Central Sector Scheme*.
- **Objectives** – To *develop industries* that will create productive economic activity in the manufacturing and service sectors.
- To *generate gainful employment*, which will lead to the area's overall socio-economic development.
- **Focus areas** – *States of North East Region*.
- **Financial Outlay** – **Rs.10, 037 crore**.
- **Nodal Agency** – Ministry of Commerce and Industry
- **Targets** – Direct employment opportunities of about 83,000 and a significant number of indirect employment.
- **Scheme period** – **10 years** from the date of notification and additional 8 years for committed liabilities.
- **Eligibility** – All new Industrial units and Expanding units for the respective incentives.
- Maximum Eligible benefits to one unit from all components of the scheme is Rs. 250 Cr.

4.3 Jal Shakti Abhiyan: Catch the Rain 2024 Campaign

Recently, the 5th edition of the 'Jal Shakti Abhiyan: Catch the Rain' campaign was launched.

- A transformative movement towards a water-secure and sustainable future.
- **Started in** – **2021**, as part of Jal Sanchay and has become an *annual* feature.
- **Nodal agency** – National Water Mission, Department of Water Resources, River Development & Ganga Rejuvenation in collaboration with Department of Drinking Water & Sanitation.
- **Aim** – To nudge states and other stakeholders to *create rain water harvesting structures* suitable to the climatic conditions and sub-soil strata before the monsoon.
- **Coverage** – *All the blocks of all districts* (rural as well as urban areas) across the country.
- **Focused interventions**
 - Water conservation and rainwater harvesting.
 - Enumerating, geo-tagging & making inventory of all water bodies and preparing scientific plans for water conservation.
 - Setting up of *Jal Shakti Kendras* in all districts
 - Intensive afforestation
 - Awareness generation.
- **JSA: CTR 2024** – It will have a distinctive emphasis on
 - *De-silting and cleaning* of water bodies.
 - *Revitalizing* Abandoned/Defunct Borewells for groundwater recharge and *Rejuvenation* of Small Rivers.
 - *Geo-tagging* of water bodies, coupled with meticulous mapping and regular updates in the State's revenue records
 - Intensified *afforestation* efforts in the catchment areas of water bodies.
 - *Snow harvesting* in hilly areas like stupas in Ladakh.
- **Implemented period** – March to November, 2024, the pre-monsoon and monsoon period in the country.
- **2024 Theme** – **'Nari Shakti se Jal Shakti'**, to recognise and appreciate the crucial role played by women in water management, conservation and sustainability.
- It will establish a powerful connection between the 'Nari Shakti' and the sustainable management of water resources i.e. Jal Shakti.

Jal Shakti Abhiyan, launched by the Ministry of Jal Shakti in 2019 as a "Jan Andolan", to initiate water conservation at the grass-root level through citizen participation across the country.

4.4 Committee on Digital Competition Law (CDCL)

The Committee on Digital Competition Law (CDCL) has submitted its report with the Draft Bill on Digital Competition Law.

- **Constituted by** – Ministry of Corporate Affairs (MCA)
- **Aim** – To examine the need for a separate law on competition in digital markets and to prepare a draft Digital Competition Act and submitting a report.
- **Composition** – **16-member** inter-ministerial committee.
- **Committee headed by** – **Manoj Govil**
- **Activity** – It reviewed whether the existing provisions of the Competition Act 2002 are sufficient to deal with the challenges emerging from the digital economy.
- **Recommendation** – They are largely *modelled on the EU's Digital Markets Act*, with some India specific variations.
- *Ex-ante (before the event) measures* be introduced to complement the current ex-post framework.
- Legislate to regulate the market power of Big Tech firms like Google and Meta to better equip the Competition Commission of India (CCI) to rule on competition matters for tech firms.
- *Identifying large digital enterprises* with a 'significant presence' in India in selected 'core digital services' and terming them as "**Systemically Significant Digital Enterprises**," or SSDEs.
 - They shall be identified by using *2 test basis*, companies' significant financial strength and significant spread.
 - These companies need to do a *self-assessment and report* it to the CCI if they fall within the same.
 - Any non-compliance with the requirement, may lead to *significant fines* which can be up to 10% of global turnover.
- Implement a mechanism for *inter-regulatory consultations*.
- **Challenges** – Ex-ante regulation could *potentially stifle innovation* which could lead to unintended consequences, such as reduced consumer choice and higher prices.

4.5 Uniform Code for Pharmaceutical Marketing Practices (UCPMP) 2024

Government issues marketing code for pharmaceutical firms under the tag 'Uniform Code for Pharmaceutical Marketing Practices (UCPMP) 2024'.

- **Issued by** – Department of Pharmaceuticals
- **Code for pharmaceutical associations** – Constitute an *Ethics Committee* for Pharmaceutical Marketing Practices
- Set up a *dedicated UCPMP portal* on their website and with the detailed procedure for lodging of complaints.
- **Code for pharmaceutical companies** – It *disallows the companies in sponsored gifts*, monetary grants or foreign trips for healthcare professionals or their families.
- Additionally, no pecuniary advantage or benefit may be offered to any person qualified to prescribe or supply drugs.
- **Code for drug regulation** – A drug must *not be promoted prior to the receipt of its marketing approval* for its sale or distribution.
- Claims for the usefulness of a drug must be based on up-to-date evaluation of all available evidence.
- The *word 'safe' must not be used without qualification*, and it must not be stated categorically that a medicine has no side effects, toxic hazards, or risk of addiction.
- The *word 'new' must not be used* to describe any drug which has been generally available or any therapeutic intervention which has been generally promoted in India for more than a year.
- **CME** – *Continuing Medical Education* involving the pharmaceutical industry & healthcare professionals should only be allowed through a transparent and verifiable set of guidelines.
- Conduct of such events in foreign locations is prohibited.

4.6 Digital Markets Act (DMA)

European Union investigates Tech giants under new digital Law.

- The Digital Markets Act (DMA) was established by the **European Union**.
- It establishes a set of narrowly defined criteria for qualifying a large online platform as a so-called gatekeeper.
- These criteria will be met if a company:
 1. Has a strong economic position, significant impact on the internal market and is active in multiple EU countries.
 2. Has a strong intermediation position, meaning that it links a large user base to a large number of businesses.
 3. Has (or is about to have) an entrenched and durable position in the market, meaning that it is stable over time if the company met the two criteria above in each of the last three financial years.
- **Benefits** – Business users who depend on gatekeepers to offer their services in the single market will have a fairer business environment.
- Innovators and technology start-ups will have new opportunities to compete in the online platform environment without having to comply with unfair terms and conditions limiting their development.
- Consumers will have more and better services to choose from, more opportunities to switch their provider if they wish so, direct access to services, and fairer prices.
- Gatekeepers will keep all opportunities to innovate and offer new services.
- They will simply not be allowed to use unfair practices towards the business users and customers that depend on them to gain an undue advantage.
- To ensure that the new gatekeeper rules keep up with the fast pace of digital markets, the Commission will carry out market investigations.

Other Important Topics

Haj Suwidha App

Union Minister for Minority Affairs has recently launched the Haj Suwidha App.

- Haj is a pilgrimage that Muslims make to Mecca, Saudi Arabia.
- The Haj Suwidha app would provide necessary information, direct access to training modules, flight details, and accommodation to those embarking on the annual pilgrimage.
- Developed by - *Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N)*.

Ocean Grace

Union Ministry of Ports, Shipping, and Waterways inaugurated the 60T bollard pull tug named 'Ocean Grace' recently.

- Ocean Grace is the **1st make in India** Approved Standard Tug Design and Specifications (ASTDS) Tug developed by the Cochin Shipyard Limited.
- Green Tugs Transition Programme (GTTP) launched in 2023 has set targets:
 - Green Tugs to start working in all major ports by 2025
 - Convert at least 50% of all the tugs into green tugs by 2030
- *National Centre of Excellence for green port and Shipping (NCoEGPS)* will act as the nodal entity for GTTP.

Digital Intelligence Platform (DIP)

Minister of Communications launched the Digital Intelligence Platform & 'Chakshu' facility on Sanchar Saathi portal.

- DIP is a secure and integrated platform for real time intelligence sharing, information exchange and coordination among the stakeholders and is not accessible to citizens.
- **Stake holders** - Telecom Service Providers (tsps), Law enforcement agencies (leas), Banks and financial institutions (fis), Social media platforms, Identity document issuing authorities etc.
- It is developed by the **Department of Telecommunications**.
- The portal also contains information regarding the cases detected as misuse of telecom resources.

Sangam: Digital Twin initiative

- **Aim** – To revolutionize infrastructure planning and management.
- The initiative was launched by the **Department of Telecommunications (DoT)**.
- It welcomes Expressions of Interest (EoI) from industry leaders, startups, MSMEs, academia, innovators, and forward-thinkers.
- **Digital Twin technology** offers a solution by creating virtual replicas of physical assets, enabling real-time monitoring, simulation, and analysis and feedback loops to achieve optimal outcomes.

Dak Karmayogi

The Department of Posts released the Special Cover commemorating successful journey of 2nd phase of Dak Karmayogi Project.

- Dak Karmayogi is an *e-learning portal* of the **Department of Posts**.
- This portal has been developed 'In-House' under vision of '**Mission Karmayogi**'.
- To recognize the good performance of employees of Department of Posts, Meghdoot Awards were conferred in 8 different categories.
- **Meghdoot Award** is the highest award of Department of Posts at National level for overall performance and excellence introduced in 1984.

India's 1st underwater metro

Prime Minister will inaugurate India's 1st under-river metro tunnel in Kolkata.

- It has been built under **Kolkata's Hooghly River** that will connect Howrah Maidan to Esplanade.
- With this, Kolkata Metro joins elite club of London, Moscow, Munich metros.
- The Howrah metro station is also the deepest in India.

'NITI for States' Platform

Minister of Communications, Railways, and Electronics & Information Technology launched NITI Aayog's '**NITI for States' Platform**.

- It is a cross-sectoral knowledge platform designed to become a **Digital Public Infrastructure (DPI)** for Policy & Good Governance.
- It will facilitate the digital transformation of governance by *equipping government officials* with robust, contextually relevant, and actionable knowledge and insights.
- It is an integrative platform to access the
 - **SAMARTH** – (Scheme for Capacity Building In Textile Sector) is a flagship skill development scheme approved in continuation to the Integrated Skill Development Scheme.
 - **National Data and Analytics Platform (NDAP)**

'CSpace' platform

Chief Minister of Kerala will launch the 'CSpace' platform at the Kairali theatre in Thiruvananthapuram, Kerala.

- It is an ***over-the-top (OTT) platform of kerala government*** implemented by Kerala State Film Development Corporation (KSFDC).
- It will be the ***first-of-its-kind initiative*** by a State government.
- The platform, aimed at ensuring space as well as revenue share for low-budget, independent films.
- It will not have a subscription fee, but will work on a ***pay-per-view model***.

e-Kisan Upaj Nidhi

Ministry of Consumer Affairs, Food and Public Distribution has recently launched 'e-Kisan Upaj Nidhi'.

- It is a digital gateway of Warehousing Development and Regulatory Authority (WDRA).
- **Aim** - To encourage more farmers, especially small farmers, to utilise the warehouses and enhance their income.
- The farmers stocking their produce at these warehouses would need to pay ***only 1% security deposit instead of the earlier 3%***.

Bengaluru's driverless metro train

- A Communications-Based Train Control (CBTC) system enabled driverless metro train is set to commission in ***Bengaluru, Karnataka***.
- **Communications-Based Train Control (CBTC)** is a modern system that uses ***radio communication*** to transfer timely & accurate train control information.

Assam's Tourist Police

Assam state's tourism department has devised a plan to implement a 'tourist police' initiative recently.

- **Aim** - To ensure the safety and security of visitors in Assam
- **Tourist Police Scheme** - Introduced in 2022 when the Union Ministry of Tourism directed all states and Union territories to establish dedicated tourist police units.
- This collaborative effort involved the Ministry of Home Affairs and the Bureau of Police Research and Development (BPR&D) in developing a framework, including standard operating procedures (SOPs).
- **Implemented states** - Andhra Pradesh, Goa, Delhi, Karnataka, Kerala, Maharashtra, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Odisha, Punjab, Rajasthan, Sikkim, and Uttar Pradesh have already introduced tourist police.

India's 1st Marine Force

The Tamil Nadu Forest Department has recently launched the country's 'first' marine force in Ramanathapuram.

- The marine elite force is to preserve and protect marine resources against exploitation in the ***Gulf of Mannar and the Palk Bay***.
- It will engage in conservation of precious marine biodiversity such as coral reefs, sea grass, and other marine flora and fauna in the eco-sensitive islands.
- The Gulf of Mannar and Palk Bay are a transboundary area between ***India and Sri Lanka***.

Nyaya Sahayak Program

The Nyaya Sahayak program will be launched in 500 Aspirational blocks in India.

- **Aim** - Nyaya Sahayak act as Community based messengers for generating door to door awareness on legal services and solutions of DoJ in Aspirational Blocks & Districts.
- It would be responsible for conducting and ensuring Door to door delivery of Legal services.

Gramdan

The Maharashtra government recently notified Mendha village as a separate Gram Panchayat under Maharashtra Gramdan Act, 1964.

- Gramdan is a social movement in India began in 1952 that involves the **voluntary donation of land to a cooperative system**. (Gramdan - "Gift of village")
- It is an expansion of the **Bhoodan movement**, which was started by Gandhian Vinoba Bhave in 1951.

Bhoodan	Gramdan
Redistribution of land from larger landowners to the landless.	The entire village land puts under a common trust.

- The first village to come under gramdan was **Mangroth in Hamirpur district of Uttar Pradesh**.
- In the Gramdan movement, donors and their descendants can work on the land and reap the benefits but they cannot sell it outside the village or to someone in the village who has not joined Gramdan.

Revamped Pharmaceuticals Technology Upgradation Assistance (RPTUAS) Scheme

Ministry of Chemicals and Fertilizers announces the Revamped Pharmaceuticals Technology Upgradation Assistance (RPTUAS) Scheme recently.

- It extends the scheme's scope to include any pharmaceutical manufacturing unit with a turnover of less than **Rs. 500 crore**.
- It entails financial assistance to drug companies to help them upgrade their facilities to produce medicines conforming to **Revised Schedule-M & WHO-GMP standards**.
- It also introduces more flexible financing options, emphasising subsidies on reimbursement basis, over **traditional credit-linked approach**.
- Pharmaceutical Technology Upgradation Assistance Scheme (PTUAS)** - It is a credit-linked scheme to help small and medium-sized enterprises (MSMEs) meet national and international regulatory standards.

India is a major exporter of medicines to low/middle-income countries which require WHO GMP certification.

Dilli Gramodaya Abhiyan

- Dilli Gramodaya Abhiyan aims to develop and **create necessary infrastructure** in the urbanized villages and new urban areas of Delhi.
- It is executed by the **Delhi Development Authority (DDA)**.

KIRTI Programme

Union Minister for Youth Affairs & Sports inaugurated Khelo India Rising Talent Identification (KIRTI) programme.

- It aims to create a pyramidal structure starting from the grassroots level and culminating in the development of elite athletes for achieving excellence at international platforms.
- The Target Olympic Podium Scheme sits at the top of the pyramid.
- Targeted age-group** -9 to 18 years i.e. school-going age.
- It is a nation-wide programme under the **Khelo India mission** (To revive the sports culture at the grass-root level).

Target Olympic Podium Scheme (TOPS)

- Ministry of Youth Affairs and Sports (MYAS) launched it in 2014.
- It is an attempt to assist India's top athletes and revamped in 2018 to establish a technical support team for managing the TOPS athletes and providing holistic support.

Khelo India Scheme

- The Khelo India Scheme is the flagship Central Sector Scheme of the Ministry of Youth Affairs & Sports.
- Khelo India Mission aims at infusing sports culture and achieving sporting excellence in the country thus allowing the populace to harness the power of sports through its cross-cutting influence.

PB-SHABD

Union Minister of Information and Broadcasting has recently launched the Prasar Bharti - Shared Audio Visuals for Broadcast and Dissemination (PB-SHABD).

- **Aim** - To provide daily news feeds in video, audio, text, photo and other formats to the subscribers from media landscape.
- **Launched by** - **Ministry of Information and Broadcasting.**
- As an introductory offer, the services would be available free of cost and help the smaller newspapers, TV channels and digital portals immensely.

Digital Criminal Case Management System (CCMS)

Union Home Minister has launched a unique Digital Criminal Case Management System (CCMS) Platform recently.

- **About** - It is a browser-based software to help the State Police forces in their investigations and prosecution.
- **Designed by** - **National Investigation Agency (NIA).**
- **Significance** - Enable the NIA personnel to better co-ordinate in terrorism and organized crime cases, thereby improving justice delivery.

Sankalan App

- **About** - Collection of new criminal laws by **National Crime Records Bureau (NCRB).**
- **Significance** - Designed for navigating through new criminal laws as a bridge between old and new criminal laws.
- Enables the users to run the application on offline mode.

AVGC-XR policy

Kerala's cabinet has approved a new Animation, Visual Effects, Gaming, Comics and Extended Reality (AVGC-XR) sector policy.

- The policy aims at driving the inception and expansion of 250 such companies and creation of 50,000 new jobs in the sector by 2029.
- Through this, the State also expects to account for 10% of India's export revenues in the AVGC-XR industry.

Bharat Pashudhan

- It is a **digital database for livestock animals in India,** part of India's Digital Public Infrastructure.
- The app allows users to register the births and deaths of animals, and to create animal identification using the unique ID number or Pashu Aadhaar.
- **Pashupalak App** empowers the farmers to access all free and paid livestock related schemes/services.

eShram portal

- **eShram** - To create a **National Database of Unorganized Workers (NDUW)** for optimum realization of their employability and extend the benefits of the social security schemes to them.
- **Ministry** - Developed by the Ministry of Labour & Employment.
- It is the **1st-ever national database of unorganised workers** including migrant workers, construction workers, gig and platform workers, etc.

- The portal is seeded with **Aadhaar**, used for enrollment, registration, collection, and identification of the required data of all the unorganized workers.
- **Eligibility** - Any worker who is unorganized and aged between **16-59**.

UDGAM Portal

- **UDGAM** (Gateway to Access Information for Unclaimed Deposits) is an online portal launched by the **Reserve Bank of India**.
- It facilitates the registered users **to search unclaimed deposits/accounts** across multiple banks at one place in a centralised manner.
- All unclaimed deposits/accounts that are part of Depositor Education and Awareness (DEA) Fund of RBI can be searched in UDGAM portal.
- Then the unclaimed deposits can be claimed from the respective bank.
- **Unclaimed Deposit Reference Number (UDRN)** is a unique number assigned to each Unclaimed account/ deposit transferred to Depositor Education and Awareness (DEA) Fund of RBI.

Currently, 30 banks representing 90% of unclaimed deposits in India are part of UDGAM.

Animal Birth Control (ABC) program

- ABC program aims to **control the population of stray dogs in India without cruelty**.
- The program involves catching dogs, sterilizing them, vaccinating them against rabies, and releasing them back to their original location.
- The rules for the ABC program announced in April 2023 will replace the 2001 rules.
- It will be implemented by local bodies, municipalities, municipal corporations, and panchayats.

India accounts for 36% of the world's **rabies** deaths and 65% of rabies deaths in Southeast Asia.

cVIGIL

- cVIGIL is an innovative mobile application for citizens to report Model Code of Conduct and Expenditure violations during the elections.
- It is developed by the **Election Commission of India (ECI)**.
- The app stands for Vigilant Citizen, and encourages citizens to take a proactive role in free and fair elections.
- The app allows citizens to Register complaints, Report anonymously and Use geotagging.

5. INTERNATIONAL RELATIONS

5.1 CAROTAR

Thailand objected to India's custom regulation, CAROTAR at the ongoing India-ASEAN Free Trade Agreement (FTA) review.

- **CAROTAR** – Customs (Administration of Rules of Origin under Trade Agreements) Rules.
- **Nodal agency** – Central Board of Indirect Taxes and Customs.
- **Implemented in** – 2020.
- **Aim** – To regulate domestic importers by strictly verifying the *rules of origin* under the free trade agreements (FTAs) and to curb the influx of Chinese products claiming fraudulent exemptions under the guise of ASEAN exports.

The Association of Southeast Asian Nations (ASEAN) is a grouping of 10 Southeast Asian states which promotes intergovernmental cooperation and facilitates economic integration amongst its members.

- **Need** – Earlier, merely a country of origin certificate, issued by a notified agency in the country of export was sufficient to avail the benefits of FTAs.
- It was exploited in many cases to avail duty concessions.
- **Provisions** – It mandates the supplier to provide the Indian purchaser with a *Certificate of Origin (CoO)* from the issuing authority in the exporter’s state, confirming the product’s origin for import validation.
- **Significance** – It prevents a country that has FTA with India from dumping goods from some 3rd country in the Indian market by just putting a label on it.

The ASEAN-India Trade in Goods Agreement (AITIGA) is a trade deal between ASEAN and India, which came into effect in 2010 to steadily increasing trade between them.

5.2 ISIS- K

The Islamic State Khorasan (ISIS-K) has claimed responsibility for the attack at Moscow’s Crocus City Hall which resulted in at least 143 deaths and hundreds injured.

- -K emerged in eastern Afghanistan in late 2014 and quickly established a reputation for extreme brutality.
- **Khorasan-** It refers to an ancient caliphate in the region that today encompasses parts of Afghanistan, Iran, Pakistan and Turkmenistan.
- **Primary motive-** It seeks to destabilize, overthrow, and supplant existing governments in the historic Khorasan region with the goal of creating a Caliphate in South and Central Asia, governed by a strict interpretation of Islamic sharia law, which they plan to expand beyond the region.
- **Threat-** ISIS-K has been a significant threat to the Taliban’s authority despite a decline in membership since 2018 due to losses inflicted by the United States and the Taliban.

Major high profile attacks

- **Kabul airport attack, 2021-** It occurred during the US’s withdrawal from Afghanistan, resulting in the deaths of US troops and at least 175 Afghan civilians.
- **Russian embassy bombing, 2022-** A suicide bombing at the Russian embassy in Kabul.
- **Kerman Bombings, 2024-** Twin bombings in Kerman, Iran, which claimed the lives of nearly 100 people.

Major terror outfits of the world	Operation base
Al-Qaeda	It shifted based from Pakistan, Taliban -ruled Afghanistan and later expanded to other parts of the world, primarily in the Middle East and South Asia.
Boko Haram	It is active in Nigeria, Chad, Niger, Cameroon, and Mali.
Harkat-ul-Mujahideen	Pakistan and Afghanistan.
Lashkar-e-Taiba	It is a Pakistan-based group that primarily fights Indian control over Jammu and Kashmir.
Jaish-e-Mohammed	It is a Pakistan-based terrorist group active in Kashmir.
Islamic State of Iraq and Levant (ISIL)	It operates mainly in western Iraq and eastern Syria.

Other Important Topics

Pancheshwar Multipurpose Project

- It is a bi-national hydropower project between **India and Nepal** to generate energy and improve irrigation.
- The project involves building 2 dams on the **Mahakali River**.

- India and Nepal had signed a Treaty known as ***Mahakali Treaty*** in February 1996 with the main aim to implement Pancheshwar Multipurpose Project.
- The ***Mahakali River***, also known as the Sharda River or Kali River, is a ***transboundary river*** starting from the Milan glacier of India and Lipulekh of Nepal.

Abortion in France

- French lawmakers recently approved a bill to enshrine ***abortion rights in France's constitution***.
- France is the only country to explicitly guarantee a woman's right to voluntarily terminate a pregnancy.

Chushi Gangdruk

- Chushi Gangdruk is a ***Tibetan guerrilla outfit*** that fought against the People's Republic of China (PRC) in Tibet from 1956 to 1974.
- The group's name translates to ***"4 Rivers, 6 Ranges"*** and refers to Amdo and Kham, regions of eastern Tibet.
- ***Andrug Gompo Tashi***, also known as Andrug Jindak, established the group on June, 1958, and was the leader and financier of the group.

E-cigarettes ban in New Zealand

- New Zealand recently said that it would ban ***disposable e-cigarettes or vapes***, and raise financial penalties for those who sell such products to minors.
- ***India bans e-cigarettes in 2019.***
- ***Disposable e-cigarettes*** - A type of e-cigarette designed to be used one time (not rechargeable or refillable)

Francis Scott Key bridge

Baltimore's Francis Scott Key Bridge collapsed after a container ship with all Indian crew members smashed into the bridge's tower.

- The Francis Scott Key Bridge is situated in ***Maryland, U.S.***
- The bridge spanned across the ***Patapsco River and Baltimore harbour.***
- It was opened in ***1977*** in honour of ***Francis Scott Key***, a 19th Century Maryland poet who wrote the words for the US national anthem, the Star Spangled Banner.
- It is described as a ***continuous truss bridge***, and it is the 3rd longest bridge of its type in the world.

Bahais

- Bahais are members of a religious movement that ***originated in Iran*** in the 19th century.
- They believe that all religions come from the same source and that ***all people are equal, regardless of their race, gender, or nationality.***
- They also believe in the ***oneness of humanity*** and devote themselves to the abolition of racial, class, and religious prejudices.
- It has ***no priesthood*** and ***does not observe ritual forms*** in its worship.

Same sex marriage in Thailand

- Thailand is set to become the ***1st nation in Southeast Asia*** to legalize same-sex marriage.
- ***1st Asian country*** to legalise same-sex marriage - ***Taiwan (2019).***
- ***1st South Asian country*** to legalise same-sex marriage - ***Nepal (2023).***

6. INTERNATIONAL ORGANISATIONS

6.1 Biodiversity Beyond National Jurisdiction (BBNJ) Treaty

The Blue Leaders High-Level Event on Biodiversity Beyond National Jurisdiction was held in Belgium.

- **About** - It is an international agreement for the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction.
- This new agreement was developed within the framework of **UNCLOS**.
- It is also known as **High Seas Treaty**.
- It is a **legally binding** instrument with the main international agreement governing human activities at sea that is also known as the constitution of the ocean.
- **Aim** - The treaty aims to increase the percentage of protected areas on the high seas.
- **Provisions** - The treaty will ensure that profits from marine genetic resources (MGR), materials of plant, animal or microbes, are shared equitably and fairly.
- The treaty provides ground rules for **Environmental Impact Assessments (EIA)**, which deal with identifying and evaluating the potential impacts an activity could have on the ocean.
- **Ratification** - The Blue Leaders High-Level Event on BBNJ decided to use the United Nations Ocean Conference to be held in 2025 as a platform to bring the BBNJ Treaty into force.
- So far, 88 countries are signatories to the treaty and only Chile and Palau, have ratified it so far.
- The BBNJ will enter into force when at least 60 countries ratify it.
- The agreement is opened for signature between September 20, 2023 to September 20, 2025. After this deadline, countries can no longer sign.
- **India** - India is **yet to sign** the treaty.

The high seas are areas beyond 200 nautical miles from the exclusive economic zones of coastal countries. No country is responsible for the management and protection of resources in high seas.

The UNOC Conference 2022 was co-hosted by the Governments of Kenya and Portugal.

Other Important Topics

Yaounde Declaration

- Health ministers of 11 African countries committed to end malaria deaths at the Yaounde conference in Cameroon's capital Yaounde.
- **Yaounde Declaration** also deals with African countries and organisations to take ownership of the tax transparency agenda promoting it to serve African interests in fighting against tax evasion and illicit financial flows (IFFs).

Africa Club

- Africa club is an **Alliance of African Multilateral Financial Institutions** (which are African owned and controlled).
- **Launched** - 37th African Union Summit.
- It aims to amplify Africa's influence in the global financial system by aligning its functions with the Sustainable Development Goals and the **African Union's Agenda 2063**.
- **Members**
 - African Export Import Bank,
 - Trade and Development Bank,

- Africa Finance Corporation,
- African Reinsurance Corporation,
- African Trade and Investment Development Insurance,
- Shelter Afrique Development Bank and ZEP – RE (PTA Reinsurance Co).

Sweden in NATO

- Sweden formally joined NATO as the **32nd member** recently.
- The North Atlantic Treaty Organization (NATO) is a **trans-atlantic** military and political alliance of its member countries.
- NATO was created in 1949 by the United States, Canada & other Western European nations to provide collective security against the Soviet Union.
- NATO's fundamental goal is to safeguard the freedom and security of its members.

Finland became the 31st member of the North Atlantic Treaty Organization (NATO).



World Cooperative Economic Forum (WCEF)

On the lines of the World Economic Forum, some co-operative sector leaders and experts have formed the World Cooperative Economic Forum (WCEF), in New Delhi recently.

- The WCEF will endeavour to promote cooperative thinking and cooperative movement.
- It will raise issues and concerns of the sector with governments and other stakeholders around the globe.

International Telecommunication Union's Digital Innovation Board (DTB)

Dr Neeraj Mittal was unanimously elected as co-chair of the Digital Innovation Board of International Telecommunication Union's (ITU).

- **Aim** - To create a more inclusive and equitable digital future for all.
- It formed under the aegis of **Innovation and Entrepreneurship Alliance for Digital Development.**
- The Digital Innovation Board comprises of Ministers and Vice Ministers of Telecom/ICT of **23 Member Countries** of ITU.

International Telecommunication Union (ITU)

- ITU is the United Nations specialized agency for information and communication technologies (ICTs).
- The Organization is made up of **193 Member States** and more than 1000 companies, universities and international and regional organizations.
- **Headquarters - Geneva, Switzerland**
- ITU is the oldest agency (since 1865) in the UN family.

The COP Presidencies Troika

COP28 launches 'The COP Presidencies Troika' in partnership with the COP29 and COP30 Presidencies recently.

- It is mandated by the **UAE Consensus**, unites COP28 with the next 2 COP Presidencies Azerbaijan and Brazil to drive ambitious collective climate action.

- The Troika will aim to raise and reframe ambition for the development process of the next round of Nationally Determined Contributions (NDCs), 2025.
- The troika's main aim is to coherently address climate action under the **1.5°C umbrella**.

Global Summit on Extreme Heat

- It is the **1st Summit on Extreme Heat**.
- **Aim** – To find solutions to lessen impacts of extreme heat, save lives and mitigate costs as 2023 was the hottest on record.
- **Organized By** – United States Agency for International Development (USAID) and International Federation of Red Cross and Red Crescent Societies (IFRC).
- **Initiatives to combat extreme heat**
 1. IFRC and USAID Extreme Heat Global Action Hub
 2. Fire Grand Challenge Prize
 3. Famine Early Warning Systems Network (FEWS NET)
 4. Interactive Heat Exposure Projections Map
 5. Guidance on Extreme Heat for Federal Agencies Operating Overseas and United States Government Implementing Partners
 6. Toolkit for higher education, created by the University of Pennsylvania's Perry World House

7. ECONOMY

7.1 Small and Medium REIT (SMREIT)

The Securities and Exchange Board of India (SEBI) has issued regulations to establish guidelines for creation of Small and Medium Real Estate Investment Trusts (SM REITs).

- The new regulations will be called SEBI (REIT) (Amendment) Regulations 2024.
- **Aim** – To regulate the fractional ownership industry and safeguard investor interests, incorporating both commercial and residential properties within the new framework.

Fractional ownership allows individual investors to co-own commercial or residential properties as an alternative investment route.

Real Estate Investment Trust (REIT)

- A company that owns, operates, or provides financing for income-generating real estate properties.
- **Current asset base** – Rs.500 crore.
- **Role** – These pool funds from investors, directing them toward various commercial real estate ventures.
- They are similar to shares and are listed on stock exchanges.
- **3 REITs in India** – Embassy Office Parks REIT, Mindspace Business Parks REIT, and Brookfield India Real Estate Trust.
- **SMREITs** – Small and Medium REIT (SMREIT), which may raise funds from Indian and foreign investors by the issuance of units.
- **Fund pooling** – It may gather funds starting from ₹50 crore by issuing units to a minimum of 200 investors.
- **Fund utilization** – Used for acquiring and managing real estate assets, generating income for the investors.
- **Ownership of assets** – It will be structured through 1 or more schemes, each operating under special purpose vehicles (SPVs).
- **An investment manager** – He/she is responsible for setting up an SM REIT and required to

- Have a net worth of at least ₹20 crore
 - Have a separate trustee for oversight.
 - Maintain a website detailing all SM REIT schemes enhancing transparency and investor access to information.
- **Significance** – It is expected to open the doors to fractional ownership of rent yielding real estate assets, including uber-luxury 2nd homes across the country.

7.2 Trade Secrets

The 22nd Law Commission headed by Justice Ritu Raj Awasthi has recommended a legislation to protect trade secrets with a provision to protect whistle-blowers.

- **Trade secrets** – According to World Intellectual Property Organization, “Trade secrets are **intellectual property (IP) rights** on confidential information which may be sold or licensed”.
- Unlike other forms of intellectual property, which are limited in duration, trade secrets can be **protected indefinitely**.
- **Criteria to qualify a trade secret** – To qualify as a trade secret, the information must be:
 1. Commercially valuable,
 2. Be known only to a limited group of persons,
 3. Be subject to reasonable steps taken by the rightful holder of the information to keep it secret, including the use of confidentiality agreements for business partners and employees.
- The unauthorized acquisition, of such secret information in a manner contrary to honest commercial practices by others is regarded as an unfair practice and a violation of the trade secret protection.
- **Regulation of trade secrets** - Currently, **India lacks a specific law** for the protection of trade secrets.
- Instead, they are safeguarded under the general laws governing contracts, common law, criminal law, and principles of breach of confidence and equity.
- **National Intellectual Property Rights Policy, 2016**, and the Parliamentary Standing Committee Report have brought back focus on the need for introducing legislation to deal with trade secrets.

Law Commission of India is a non-statutory body and is constituted by a notification of Ministry of Law & Justice to make recommendations to the Government in the form of Reports.

7.3 Exchange traded fund vs Mutual Fund

SEBI has directed mutual fund houses to stop accepting any more inflows in schemes that invest in overseas exchange-traded funds (ETFs), starting April 1, 2024.

- **Exchange Traded Funds (ETFs)**- They are marketable securities, it is a type of pooled investment security that can be bought and sold much like an individual stock.
- **Investment cap**- The directive comes as the mutual industry has already reached 95% (950 million dollars) of the 1 billion dollars limit
- **RBI's overall cap**- Mutual funds have overall cap of 7 billion dollars for overseas investments with a separate 1 billion dollars cap for ETFs.

Key aspect	ETFs	Mutual Fund
About	They are passively managed funds that merely replicate an index, these funds usually hold all the stocks in the same weight as they are held by the underlying index.	It is described as professionally managed investment schemes that collect money from various investors and then invest it in diversified holdings.
Trading and liquidity	They are traded on the stock exchange like any other stock, making them more liquid.	They can only be bought or sold at the end of the day at the <u>Net Asset Value</u> price(It indicates one unit of mutual fund)

Flexibility	It is <i>freely traded in the market</i> and can be bought and sold as per the investor's convenience.	It can be bought or sold only by placing a request with the fund house.
Cost structure	They have <i>lower expense ratios</i> as they merely replicate the performance of the index.	They have <i>higher management fees</i> as they are managed actively by an experienced fund manager.
Commissions	They are traded like any other share on the exchange, hence investors need to pay commission on sale and purchase units as per prevailing rules.	There is no need to pay any commission for the sale and purchase.
Investment approach	They are passively managed, which means the fund mirrors a particular index, making them less risky and transparent.	They are actively managed, which means fund managers invest in securities based on their analysis and market outlook.
Minimum investment	ETFs allow investors to start with <i>smaller amounts</i> .	Mutual funds typically require a <i>higher</i> minimum investment.
Taxation	They are more tax-efficient as they have a <i>lower capital gains tax</i> .	Mutual Funds are <i>less tax-efficient</i> .
Diversification	ETFs offer <i>more targeted investments</i> that mirror a particular index.	Mutual funds <i>offer more diversification</i> options and exposure to a broader range of securities.
Types	There are mainly 5 types: equity ETF, bonds ETF, commodity ETF, international ETF and sectoral/thematic ETF.	Equity schemes, Debt schemes, hybrid schemes, solution oriented schemes etc.,

7.4 Investment Facilitation for Development (IFD) Agreement

India and South Africa formally opposed the adoption of IFD agreement for consideration during the 13th Ministerial Conference (MC13) of WTO.

- **IFD** – A most-favoured-nation-based, plurilateral agreement of World Trade Organization (WTO).
- The agreement explicitly excludes market access, investment protection and investor-state dispute settlement.
- **Launch** – Originally launched in 2017 on a plurilateral basis by few WTO countries through a process known as the Joint Statement Initiative.
- It was finalized in 2023.
- **Aim** – To create legally binding provisions to facilitate investment flows.
- To develop predictable, transparent and open investment rules that will contribute to more efficient investment flows and increased business confidence.
- **Membership** – Open for all WTO members to join.
- Currently, it has 120 of 166 WTO member countries (more than 70% of the membership).
- India is not a member as it opined that investment-related issues can't be brought under the WTO's ambit.
- **Plurilateral agreement** – The 120 countries wanted to include the IFD Agreement as a plurilateral agreement (PA) within Annex 4 of the WTO Agreement.
- While the WTO is a multilateral trade organisation, Article II.3 of the WTO Agreement categorically allows for PAs.
- According to the Marrakesh Agreement (the WTO's constitution), a new PA can only be adopted through 'Annexure 4' rules, by explicit consensus of all WTO Members.
- Unlike multilateral agreements, PAs under the WTO are binding only on those members that have accepted them.

7.5 Current Account Deficit (Vs) Capital Account Deficit

Current account deficit narrows to 1.2% of GDP at \$10.5 billion in Oct-Dec: RBI.

Current Account	Capital Account
<ul style="list-style-type: none"> A current account records a country's transactions with the rest of the world in goods, services, income, and transfers. Most of the traditional forms of international trade are included in the current account. These transactions are usually more immediate and visible than those recorded in the capital account. Components – <ol style="list-style-type: none"> Goods – Export and import of physical goods such as raw materials, consumer goods, and machinery. Services – Exchange of intangible services, like tourism, travel, freight services, insurance, repair, consulting, investment banking, brokerage, education, health care, accounting, etc. Income – Refers to the flow of income between residents of different countries, including wages, salaries, and dividends. Current Transfers – Current transfers are one-way payments made without the expectation of receiving anything in return, such as foreign aid and remittances from workers abroad. Net Exports – Refers to the difference between a country's exports and imports of goods and services. Deficit – The current account deficit is a measurement of a country's trade where the value of the goods and services it imports exceeds the value of the products it exports. 	<ul style="list-style-type: none"> Capital account inflows and outflows reflect changes in the value of an asset through investments, loans, bank balances, and property value. It is not as immediate and invisible as the current account. When there is an imbalance in trade in goods and services between two nations, these imbalances are financed by offsetting financial and capital flows. A country with a large trade balance deficit will have large investment surpluses from foreign countries and large demands on foreign assets. Components – <ol style="list-style-type: none"> Domestic Investment Abroad – Includes investments made by residents of a country in foreign entities, such as FDI and portfolio investments. Additional Paid-in Capital – It represents the amount received from the stockholders over face value. It is also known as stock premium. Changes in Reserves – Refers to changes in a country's foreign exchange reserves held by the central bank to manage exchange rate fluctuations. Debt Forgiveness – Refers to the cancellation of debt owed by a country to another country or international organization. Deficit – A deficit in the capital account means money is flowing out of the country, and it suggests the nation is increasing its ownership of foreign assets.

Surplus

- Surplus is a condition when incomes or receipts overreach costs or expenditures and normally refers to the financial conditions of the governments.
- The term savings is preferred over the term surplus, and surplus implies that the government is being effectively operated and regulated.

(in \$ bn)	Q3FY23	Q3FY24
Current Account Balance	-16.8	-10.5
Current Account Balance as % of GDP	-2%	-1.20%
Goods	-71.3	-71.6
Services	38.7	45
Primary income	-12.7	-13.2
Secondary income	28.5	29.3

Note : - denotes deficit Source: RBI

7.6 Domestic Systemically Important Insurers (D-SIIs)

The public sector insurance companies such as the Life Insurance Corporation of India (LIC) continue to be identified as Domestic Systemically Important Insurers (D-SIIs).

- D-SIIs** – D-SIIs are [insurance companies](#) which are perceived as 'too big or too important to fail' (TBTF) based on their size, market importance, and domestic and global interconnectedness.
- Therefore, the continued functioning of D-SIIs is critical for the uninterrupted availability of insurance services to the national economy.

LIC and New India are the largest life and general insurance companies in the country, respectively and General Insurance Corporation of India (GIC Re) is the sole Indian reinsurer.

- **Efforts** – Given the nature of their operations and the systemic importance of the D-SIIs, these [insurers](#) have to carry forward their efforts on the following:
 1. Raise the level of corporate governance.
 2. Identify all relevant risks and promote a sound risk management framework and culture.
- **RBI Framework** – The Reserve Bank had issued the Framework for dealing with Domestic Systemically Important Banks (D-SIBs).
- D-SIB framework requires the RBI to disclose the names of banks designated as D-SIBs starting from 2015 and place these banks in appropriate buckets depending upon their Systemic Importance Scores (SISs).
- Based on the bucket in which a D-SIB is placed, additional common equity requirement has to be applied to it.

State Bank of India, ICICI Bank and HDFC Bank have been classified as domestic systemically important banks (D-SIBs).

The Insurance Regulatory and Development Authority of India (IRDAI)

- [IRDAI](#) is a government apex body responsible for regulation and developing the insurance industry in India.
- It was constituted as a statutory body as per the provisions of Insurance Regulatory and Development Authority Act 1999.
- The body was created on the recommendations of the Malhotra Committee Report.
- All the companies wanting to run the insurance business in India are to be registered with the IRDAI.

Other Important Topics

RBI's Gold Imports

India has recently allowed RBI to import gold without paying import levies.

- Generally, import of gold attracts 15% import duty, including 5% agriculture infrastructure development Cess.
- According to the World Gold Council data, the RBI has a gold holding of **812.3 tonne** in January 2024.
- Of that, 388.06 tonnes is held overseas and 372.84 tonnes is held domestically.
- **Need-** To diversify the forex reserves and hedge against foreign currency risks
- **Agriculture Infrastructure and Development Cess (AIDC)**
- It is a tax on the commercial production of agricultural goods in India.
- A cess is a form of tax levied by the government on tax with specific purposes till the time the government gets enough money for that purpose.
- It was announced on certain items, including petrol, diesel, gold and some imported agricultural products to boost agriculture infrastructure.

Negative interest rate policy

Bank of Japan exits world's last negative-rate regime in landmark policy shift recently.

- A negative interest rate policy (NIRP) is a monetary policy that allows central banks to set interest rates **below 0%.**
- This policy used to encourage borrowing, spending, and investment, rather than hoarding cash.
- Central banks and regulators use negative interest rates when there are **signs of deflation.**
- In a negative interest rate environment, borrowers are paid interest instead of paying interest to lenders.
- NIRP is seen as a “last resort” policy to use after exhausting all other options.

8. AGRICULTURE

Global Seed Vault

- **Location** - Spitsbergen, part of Norway's [Svalbard](#) archipelago.
- It stores millions of seed samples from around the world and is only accessible 3 times a year.
- Also known as “**doomsday**” vault, as the reserve of seeds can be of use in case of an apocalyptic event or a global catastrophe.
- The facility was built in 2008 with assistance from the Norwegian government and the Global Crop Diversity Trust.
- It is part of the international system for conserving plant genetic diversity guided by the **UN organisation for Food and Agriculture (FAO)**.
- The Arctice World Archive that aims to preserve data for the world's governments and private institutions is also located in Spitsbergen, Norway.



E-crop

- It is a crop simulation model-based device which provides periodical advice as SMS to growers about water and nutrient (nitrogen, phosphorus and potassium) requirements.
- It was developed by Santhosh Mithra of the Central Tuber Crops Research Institute (CTCRI), Kerala.
- The Indian Patent Office recently granted patent to E-Crop with retrospective effect from 2014.
- Farmers, through an app 'krihi kruthya', also record and send the data on the soil moisture content to the server.

9. ENVIRONMENT

9.1 International Big Cat Alliance (IBCA)

The Union Cabinet approved the establishment of International Big Cat Alliance (IBCA) with a one-time budgetary support of Rs.150 crore for a period of 5 years from 2023-24 to 2027-28.


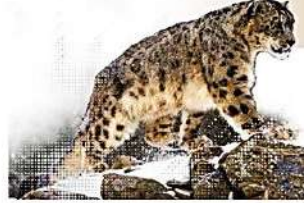



- It is a multi-country, multi-agency coalition.
- **Launched in** – 2023, by India in commemoration of 50th anniversary of Project Tiger (1973).
- **Objective** – To ensure cooperation for the **conservation of 7 big cats** by arresting decline in population and reverse the trend.
- To establish a *central repository* for knowledge sharing, capacity building, networking, advocacy, finance and support research.
- **Partnership** – 96 **big cat range countries**, also include interested non-range countries, conservation partners and scientific organisations working in the field of big cat conservation.
- **Administration** – An assembly of members, a standing committee as well as a secretariat based in India.
- **Framework of Agreement** (statute) – It has been drafted largely on the pattern of the International Solar Alliance (2015).

The Indian subcontinent has been historically home to the Bengal tiger, Asiatic lion, Indian leopard, Indian/Asiatic cheetah as well as Snow leopard.

Big Cats

- **Big Cat** – A term that is used in informal speech to apply to any large species of the family Felidae.
- Usually, it applies to the members of the genus Panthera but 2 other cats Puma (Puma concolor) and Cheetah (Acinonyx jubatus) are also usually included in most listings of 'big cats'.

- **7 Big cats** – Lion, tiger, leopard, cheetah, snow leopard, jaguar, and puma.
- **In India** – 5 out of 7 cats *except jaguar and puma* are found here.
- While cheetah was declared extinct in 1952, it is now reintroduced as a part of Cheetah reintroduction project.

<p>GENUS PUMA Closely related to the domestic cat, this genus has only one extant species, the cougar.</p> <p>COUGAR PUMA CONCOLOR SIZE: 40-100KG STATUS: LEAST CONCERN</p> <p>The Cougar is the second-largest cat in the Americas; jaguar is largest. Cougars are also called mountain lion/panther across their range from the Canadian Yukon to the Southern Andes. Concolor is latin: "of uniform colour".</p> 	<p>LEOPARD PANTHERA PARDUS SIZE: 30-90KG STATUS: VULNERABLE</p> <p>Similar in appearance to the jaguar with a rosette patterned coat, the leopard was described by Jim Corbett as "the most beautiful of all animals" for its "grace of movement and beauty of colouring". The most adaptable of all big cats, they occupy diverse habitats at all altitudes across Africa and Asia. Like black jaguars, melanistic leopards are called black panthers.</p> 
<p>GENUS ACINONYX This is a unique genus within the cat family, with only one living member, the cheetah.</p> <p>CHEETAH ACINONYX JUBATUS SIZE: 20-70KG STATUS: VULNERABLE</p> <p>Fastest land mammal; only cat without retractable claws – the grip helps it accelerate faster than a sports car (0-100 km/hr in 3secs). They are not aggressive towards humans; they have been tamed since the Sumerian era. They don't breed well in captivity—females play hard to get. Cheetahs are not big; they hunt during the day to avoid competing with other big cats.</p> 	<p>SNOW LEOPARD PANTHERA UNCIA SIZE: 25-55KG STATUS: VULNERABLE</p> <p>Ghost of the mountains, this smoky grey cat lives above the snow line in Central and South Asia. The most elusive of big cats, it cannot roar, and has the longest tail of all—which comes in handy for balance while hunting along cliffs, and also gives warmth when wrapped around the body. The snow leopard is the state animal of Ladakh and Himachal.</p> 
<p>GENUS PANTHERA Large wild cats that roar but can't purr. Among them, the lion, leopard, and jaguar are more closely related; the other strand has the tiger and snow leopard. The snow leopard is an exception in that it can't roar.</p> <p>TIGER PANTHERA TIGRIS SIZE: 75-300KG STATUS: ENDANGERED</p> <p>Jim Corbett's "large-hearted gentleman with boundless courage", the solitary and strongly territorial tiger is the largest of all wild cats and the most ancient of the Panthera. Primarily a forest animal, its range is the Siberian taiga to the Sunderban delta. It's the national animal of India, Bangladesh, Malaysia, and South Korea.</p> 	<p>LION PANTHERA LEO SIZE: 100-250KG STATUS: VULNERABLE</p> <p>Native to Africa and Asia, the lion is the most social cat, and lives in groups called 'prides'. They prefer open forests such as scrubland, and adult males have a prominent mane. The lion is among the most widely recognised of animal symbols— from the pillar of Ashoka to the main entrance of Buckingham Palace to the logo of MGM.</p>  <p>JAGUAR PANTHERA ONCA SIZE: 50-110KG STATUS: NEAR THREATENED</p> <p>The largest cat in the Americas, the jaguar has the strongest bite force of all wild cats, enabling it to bite directly through the skull of its prey. Melanistic (black) jaguars are common, and are often called black panthers. Jaguar was a powerful motif in the</p> 

9.2 Status of Leopards in India Report

Recently, the 5th cycle of leopard population estimation (2022) was carried out and 'the Status of Leopards in India' report was released.

- **Aim** – To reveal crucial insights into leopard distribution and conservation challenges.
- **Conducted by** – National Tiger Conservation Authority (NTCA), Wildlife Institute of India (WII) in collaboration with State Forest Departments.
- It is under quadrennial "**Monitoring of Tiger, Co-predators, prey and their habitat**" exercise in tiger range States.
- **Coverage** – 20 States of India, and focussed on about 70% of the animals' expected habitat, which are India's tiger reserves and protected forest areas.
- **Scientific methodologies** – A meticulous process combining camera trapping, habitat analysis, and population modelling.

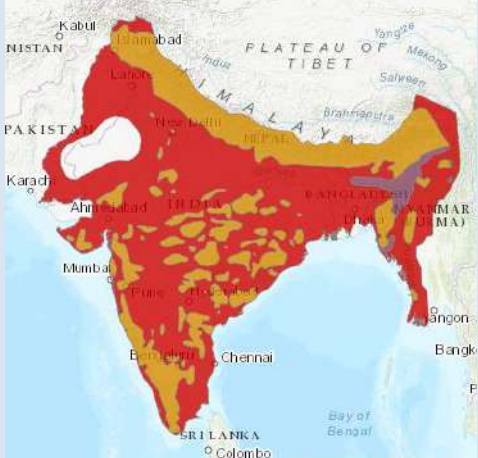
Key Findings of the report

- **8% rise in numbers** from 2018 to 2022 with *13,874 individuals* (Range - 12,616 to 15,132).
- A 1.08% per annum growth in sample area from 2018.
- The *largest growth rate of 1.5%*, in Central India & Eastern Ghats.
- A *3.4% decline per annum* in Shivalik hills and Gangetic plains.
- Only 4 States reported over a 1,000 animals, where *Madhya Pradesh houses the largest* followed by Maharashtra, Karnataka and Tamil Nadu.
- Tiger Reserves or sites with highest leopard population
 - Nagarajunasagar Srisailam (Andhra Pradesh), followed by Panna (Madhya Pradesh), and Satpura (Madhya Pradesh).
- **Threats** – Habitat loss, human-wildlife conflict, and poaching.
- Human-wildlife conflict likely reason for decline in the big cat population by 22% in Uttarakhand.
- **Significance** – The findings underscore the critical role of Protected Areas in conserving leopard populations.

Indian Leopard

- **Scientific Name** – *Panthera pardus fusca*
- **Conservation Status**
 - IUCN - Near Threatened
 - CITES - Appendix I
 - WPA, 1972 - Schedule I

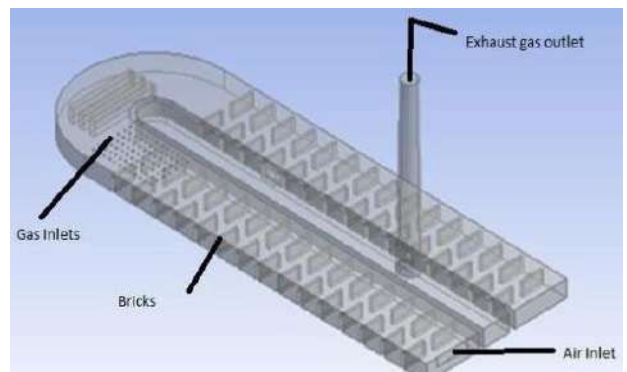
Unlike tigers, which are largely confined to forest reserves, leopards are far more adaptable and tend to be found in villages and, sometimes, even in cities where they prey on cattle and feral dogs. Thus, involved in conflict, resulting in higher mortality.



9.3 Zigzag technology in Brick kilns

A recent survey reported that 90% brick kilns in Alwar in Rajasthan shifted to zig-zag technology, and nearly all brick kilns have started using biomass fuel.

- **Need** – Traditional brick kilns with towering chimneys emits pollutants, such as particulate matter, sulphur dioxide, and nitrogen oxides which can have detrimental effects on both human health and the environment.
- **Zig zag technology** – A method of firing bricks in a kiln that uses a unique design to reduce emissions of pollutants and increase efficiency.
- **Setup** - A typical zigzag kiln typically consists of a series of chambers, each section containing a different type of brick.
- The bricks are arranged in a series of parallel rows where each row is offset from the one before it, creating a zigzag pattern.
- **Working** – Burn the kiln using fuel in a separate chamber, which produces the hot flue gases by the combustion process.
- The hot flue gases are redirected through the same bricks which leads to a more efficient burning process as it heats them from all sides.
- Cool and remove the bricks from the kiln once the firing process is complete.



- **Advantages** – It results in *less fuel consumption, lower emissions of pollutants*, and a more consistent and higher-quality product.
- **Measures taken by India** – Union Ministry of Environment, Forest and Climate Change's (MoEF&CC) issued a notification in 2022 on brick kilns for the adoption of zig-zag technology.
- The Commission for Air Quality Management's (CAQM) directed the entities for using cleaner fuel in the Delhi-NCR region.

Zigzag technology in Brick kilns can reduce black carbon by 60%, particulate matter by 40% and can also reduce the coal needed by 20%.

9.4 Global Great Backyard Bird Count (GBBC) 2024

India records 1,036 species for backyard bird count – third highest globally.

GBBC

- The **GBBC** was *launched in 1998*, in the USA and was initially restricted to the USA only.
- GBBC is a citizen-driven scientific project aimed at counting and reporting the details of birds in the area of their neighborhood.
- It was an initiative of Cornell Lab of Ornithology and the National Audubon Society of USA.
- In 2013, it took the global stage turning into a global bird census.
- GBBC India is the Indian implementation of the global Great Backyard Bird Count, which runs for 4 days every February.
- Indian birders have participated in the GBBC since the event went worldwide in 2013.
- GBBC India is coordinated by the Bird Count India collective, a coming-together of a number of groups and organisations that are interested in birds, nature and conservation.

Indian bird enthusiasts celebrated their 12th consecutive year of participation in the GBBC this time.

e-bird

- eBird is an online database of birds with online real-time data about distribution and abundance.
- Started in 2002 and was initially restricted to western hemisphere only.
- Its geographical extension grew over time and in 2010 it got a global status.

GBBC 2024

- India submitted the second-highest number of checklists and the third-highest species among all participating countries.
- Kerala recorded the highest number of checklists (14,023), followed by Tamil Nadu (13,661) and Maharashtra (5,725).
- West Bengal reported the highest number of species (538), followed by Uttarakhand (426) and Assam (420).
- Some restricted-range species spotted by Indian birders this year are: Andaman Serpent-Eagle, Andaman Woodpecker, Nilgiri Laughingthrush, White-headed Starling, Nilgiri Sholakili, White-bellied Blue Flycatcher, Andaman Treepie, Forest Owlet, Bugun Liocichla & White-bellied Sholakili

This is the first GBBC where birders from all states and Union territories participated.

9.5 4th Global mass coral bleaching in Great Barrier Reef (GBR)

The US National Oceanic and Atmospheric Administration (NOAA) has said that the world is on the brink of a fourth global mass coral bleaching event which could see many tropical reefs killed by extreme ocean temperatures, including parts of Australia's Great Barrier Reef.

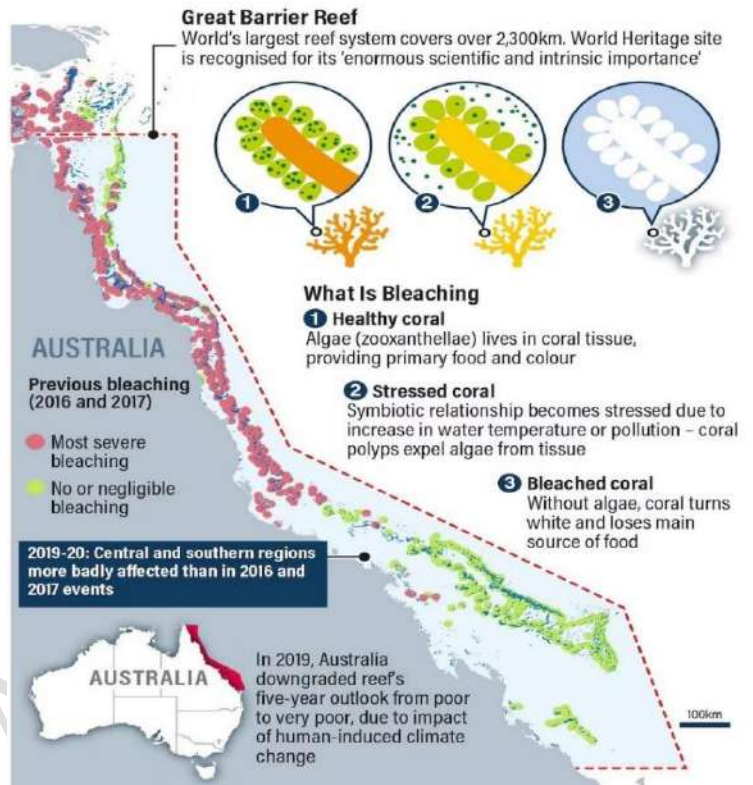
- **Corals** - Marine **invertebrates** or animals which do not possess a spine.
- They are the largest living structures on the planet.
- Each coral is called a **polyp** and thousands of such polyps live together to form a colony.

- **Corals** share a symbiotic relationship with single-celled algae called **zooxanthellae**.
- **Coral Bleaching** - When corals are stressed by changes in conditions such as temperature, light, or nutrients, they expel the symbiotic algae living in their tissues, causing them to turn completely white.
- When a coral **bleaches**, it is not dead, they are under stress and are subject to mortality.

The Great Barrier Reef is one of the natural wonders of the world and was inscribed on the World Heritage List in 1981 for its unique natural attributes and enormous scientific and environmental importance.

Bleaching in GBR

- The **Great Barrier Reef**, the largest coral system in the world, is about 2,300km long and is made up of about 3,000 individual reefs.
- The current mass bleaching event occurred as a result of **El Nino** conditions in the Pacific Ocean and elevated ocean temperatures exacerbated by climate change.
 - *El Niño is a natural climate cycle characterized by warmer-than-usual waters in the Pacific Ocean, typically increases average air and sea temperatures and can have a significant effect on rainfall, hurricanes and other severe weather.*
- **Previous mass bleaching events** - 1998, 2010 and 2014-2017.
- The World Heritage Committee has threatened to put the reef on a list of in danger global heritage sites.
- **GBRMPA** - The Great Barrier Reef Marine Park Authority (GBRMPA), which was established in 1975, oversees the efforts to preserve and protect the GBR.



To address a defined need of coral reef managers, NOAA established the Coral Reef Watch program in 2000.

9.6 State Specific Disaster

Kerala declares man-animal conflict a state-specific disaster, becoming the 1st state in the country to do so.

- **In Kerala** – This announcement is due to **Man-Elephant conflict** which had claimed lives of many people.

Human – Animal Conflict

- **Definition** – According to *IUCN Species Specific Commission*, it is defined as 'struggles that emerge when the presence of wildlife poses an actual or perceived, direct and recurring threat to human interests, leading to disagreements between groups of people and negative impacts on people and/or wildlife'.
- **Managing authority in India** – *Forest Department*, as per the Wild Life Protection Act 1972 unless it is declared as State specific disaster.
- The *chief wildlife warden of the state* is the only authority to take a call on a wild animal wreaking havoc in human settlement.

- **State specific Disaster** – They are 'disasters' within the local context in the State and which are not included in the notified list of disasters of the Ministry of Home Affairs.
- **Announced by** – State Government.
- **Funding mechanism** – *State Disaster Response Fund (SDRF)*.

- A State Government may use up to 10% of the funds available under the SDRF for providing immediate relief to the victims
- **Responsible authority** – State disaster management authority (SDMA) as per the Disaster Management Act 2005.
- **At the state level** – The Chief Minister is the ex officio chairman of the SDMA.
- **In the districts** – The district disaster management authority (DDMA) is headed by the district collector.
- **Powers** – SDMA can take actions overriding other norms, including those under the Wildlife Protection Act.
- **Section 71 of the DM Act** – No court (except the Supreme Court or a High Court) shall have jurisdiction to entertain any suit or proceeding in respect of anything done by relevant authorities in pursuance of any power conferred by this Act.
- **Section 72 of the Act** – The provisions of this Act will have an overriding effect on any other law during the specific period.
- **Coverage** – It includes natural disasters like Cyclone, drought, earthquake, flood among others and also human-animal conflicts like snakebite.

State specific Disasters	Declared State
Snakebite	Odisha
Lightning	Odisha, Kerala & Assam
Coastal Erosion	Kerala
Soil Piping	
Strong Wind	
Heat waves, Sunburn and Sunstroke	

9.7 Corbett Tiger Reserve (CTR)

The Supreme Court condemned the illegal felling of over 6,000 trees for eco-tourism at the Jim Corbett National Park.

- **Establishment** - Originally established as **Hailey National Park** in 1936, which was renamed in honor of Jim Corbett in 1956.
- **Location** - In the Nainital district of **Uttarakhand**.
- **Biodiversity** - CTR is not only the 1st national park in India, but also the 1st to come under the [Project Tiger initiative](#).
- It is renowned for having the **world's highest density of tigers**.
- The Grassland habitats are characterized by open meadows (**chaurs**) interspersed with Sal and moist mixed deciduous forests.
- There are several important chaurs abundant in wildlife: Dhikala, Phulai, Khinnanauli, Paterpani, Mohanpani, Bhadhai and Bijrani.
- It is part of the World Wide Fund for Nature's **Terai Arc Landscape Program**, aimed at protecting flagship species like the tiger, the Asian elephant, and the great one-horned rhinoceros.



9.8 Super Emitter Events

Scientists have revealed that a drilling incident took place in Kazakhstan in 2023 was possibly the 2nd biggest man-made methane leak ever in history.

- **Incident** - The drilling incident took place at an exploration well in the **Mangistau region** of southwestern Kazakhstan in 2023.
- It caused a fire that raged and released **127,000 tonnes** of methane into the atmosphere.

Super emitter' events refer to instances where a site gushes significant amounts of methane into the atmosphere.

Greenhouse Gas	GWP	Lifetime (y)
Carbon Dioxide (CO ₂)	1	variable
Methane (CH ₄)	21	12.2
Nitrous Oxide (NO ₂)	206	120
Hydrofluorocarbons (HFC)	140-11700	1.5-264
Perfluorocarbons (PFC)	6500-9200	3200-50000
Sulfur Hexafluoride (SF ₆)	23000	3200
Chlorofluorocarbons (CFC)	12000-16000	



Methane

- Methane is the **2nd most abundant greenhouse gas** in the atmosphere, after carbon dioxide (CO₂).
- **Potential** - It is a potent Green House Gas (GHG) which traps heat in the atmosphere and adds to global warming.
- **Life time** - Methane has a much *shorter atmospheric lifetime* (12 years) but it is 80 times more potent greenhouse gas than CO₂ over a period of 20 years.
- Methane is the primary contributor to the formation of ground-level ozone, a hazardous air pollutant.

Global Methane Pledge was signed by more than 150 countries in 2021, to cut their collective methane emissions by at least 30% from 2020 levels by 2030.

9.9 Process of Denotifying a Protected area

Supreme Court of India stops Assam's move to withdraw notification of Pobitora wildlife sanctuary.

- **Denotified Area** – Areas that cannot be protected with legally defined do's and don'ts like notified areas.
- **Process for de-notification** – It is governed by the provisions of *Wildlife (Protection), Act 1972*.
- The *proposals submitted by States/UTs* for alteration of the boundaries of protected areas are examined by the Standing Committee of the National Board for Wild Life (NBWL).
 - NBWL is a statutory body constituted under the Wildlife Protection Act, 1972 and chaired by Prime Minister.
- **Denotifying a sanctuary or National Park**
 - Recommendation of National Board for Wildlife
 - Approval by the Supreme Court (no specific time limit)
- **Denotifying a tiger reserve**
 - Recommendation of National Tiger Conservation Authority
 - Approval of National Board for Wildlife
- **Recommended** – Only if such alteration is not likely to cause any adverse impact on wildlife.

Protected areas
<ul style="list-style-type: none"> • About – Areas where human occupation or at least the exploitation of resources is limited. • Protected areas in India – 4 categories constituted under the provisions of the Wildlife (Protection) Act, 1972 <ul style="list-style-type: none"> ○ National Parks ○ Wildlife Sanctuaries ○ Conservation Reserves ○ Community Reserves • Apart from above protected areas, India also has <ul style="list-style-type: none"> ○ Biodiversity Reserves ○ Tiger Reserves ○ Elephant Reserves ○ Marine Protected Areas

Pobitora Wildlife Sanctuary

- It is *called 'Mini Kaziranga'* due to similarity of landscape, floral, and faunal distribution.

- **Notified in** – 1998
- **Location** – It is situated in the flood plains of River Brahmaputra in the district of Morigaon, Assam, India.
- **3 distinct categories** – Forest, grassland and water bodies or beels.
- **Biodiversity** – One-horned rhino, leopard, wild boar, Barking deer, Chinese pangolins, Leopard cat, wild buffalo, waterfowl etc.
- **Rhinoceros** – It was pegged at 107 by 2022 census, has the highest concentration of the one-horned rhinos on earth.
- **Challenges** – Boundary of Pobitora was yet to be demarcated.
- The control of khas (fallow) land was yet to be handed over to the Forest Department by the Morigaon district administration.

9.10 Tiger Conservation Landscape (TCL) 3.0

NASA satellite imagery and Google Earth Engine computing power are helping scientists develop a real-time monitoring system for tiger habitat globally.

Tiger Conservation Landscapes (TCLs)

- **TCLs** – [Tiger conservation](#) landscapes (TCLs) are large blocks of habitat with low human footprint suitable for tigers.
- **Attributes** – A TCL has the following attributes:
 - A TCL has evidence of one or more tigers over the last 10 years.
 - A TCL can consist of several adjacent blocks of habitat among which tigers can disperse, up to a distance of 4 km.
 - A TCL need not be restricted to nor contain protected areas, but instead includes the entire landscape over which tigers may disperse and become established.
 - A TCL must meet a minimum core area requirement for its largest block of habitat that is specific to the habitat-type in which it is found.
 - TCL boundaries are defined either where habitat ends with no suitable habitat within 4 km for the tiger to disperse to, or at country or ecoregion boundaries.
- **Class and Priority** – TCLs are identified according to their Class and Priority.
 - Class refers to a TCL's current conservation status and probability for achieving conservation success in the next decade (Class I is highest, Class IV is not enough information).
 - TCL priority indicates priority for conservation investment, ensuring the suite of Global and Regional Priority TCLs are representative across biomes and bioregions.
- **Previous TCLs** – The original iteration, called the tiger conservation unit analysis was produced in the late 1990s, and the second, TCL 2.0, in 2006.
- These previous maps were static, but with improvements in technology, conservationists saw a way to make a real-time system.

• **Initiative by** – [NASA](#), [the European Space Agency \(ESA\)](#), and the Google Earth Engine.

• TCL 3.0 represents the third iteration of assessing tiger habitat across Asia and where tigers still occur.

• **Goal** – To monitor changes in real time to help stabilize tiger populations across the range.

• **Uses** – TCL 3.0 uses Earth observations such as VIIRS, MODIS and Landsat products.

• TCL 3.0 uses [geographic information systems](#), known as [GIS](#).

- [GIS](#) is a technology that interprets and visualizes spatial data, such as how landscapes have changed over time, population densities, or the distance between different locations.

The TCL 3.0 program is a system that is open sources, meaning it can be applied not only to tigers, but to any species of concern.

- **Helps in** – This helps in holistically seeing the impact of human activity on the critical habitats of tigers.
- **Provides** – TCL 3.0, the mapping system provides tiger-range countries the information they need to identify priority areas, and monitor changes in the [habitat and populations](#).
- Platform for governments to align with global initiatives, such as the [Global Biodiversity Framework](#) and [Sustainable Development Goals](#), to address the challenges facing our [ecosystems](#).
- **Working of TCL 3.0** – Satellites provide constant, high-resolution imagery, which is used to analyze suitable landscapes from space.
- This data does not show what is going on under the tree canopy.
- Hence, the second layer of data comes from human footprint analysis, data collected from field surveys about the spread of urban areas and human activities.

Groups at the Wildlife Conservation Society (one of the organizations that provided funding for the project) are already working on similar maps for vulnerable and threatened animals including [lions](#), [jaguars](#) and [bison](#).

Conservation Status of Tiger

- IUCN – Endangered
- Wildlife (Protection) Act, 1972 - Schedule I
- CITES - Appendix I



9.11 Living Animal Species (Reporting and Registration) Rules, 2024

The Ministry of Environment, Forests and Climate Change has notified the Living Animal Species Rules 2024.

- **CITES** – It is an international agreement between government's aims to ensure that international trade in specimens of wild animals and plants does *not threaten the survival of the species*.
- *India is a party* to the CITES, which requires that appropriate measures are taken to enforce the provisions of the Convention.
- **Need** – Voluntary Disclosure Scheme (VDS) in 2020 created the opportunity to launder illegal stocks of exotic CITES species.
- **Rules** – All persons possessing a living specimen of an animal species shall apply for registrations *within a period of 6 months* from the date of commencement of these rules.
- And thereafter *within 30 days of possession* of such animal species, report to the concerned *State Chief Wild Life Warden*, through the PARIVESH 2.0 portal
- Further, *any transfer* of possession and birth of offsprings of such specimen(s) shall also be registered and death of such specimen(s) shall be reported.
- **Animal species** – Any living specimens of any animal species listed in Schedule IV appended to the 1972 Wildlife Protection Act which covers species under CITES.
- It does not apply to other wildlife that is already protected under the Wildlife Protection Act and cannot be kept in captivity

According to recent reports, more than 70,000 native and exotic species were trafficked via air.

Quick Facts

- **Section 49 M of the Wildlife (Protection) Amendment Act 2022** - It provides for registration of possession, transfer, reporting of birth and death of living scheduled animal species which are listed in the Appendices of CITES and listed in the Schedule IV of the Act.
- **Appendix 1 of schedule 4** – It includes endangered exotic animals and plants and import rules are stricter for them.
- **Section M of the Wildlife (Protection) Act, 1972** – It mandates that anyone possessing exotic wild animals listed under Schedule IV of the Act must obtain a registration certificate from the Management Authority to comply with CITES regulations.
- **Breeders of Species Licence Rules, 2023** – Those who breed exotic species protected under CITES and listed in Appendix 1 of schedule IV of Wildlife Protection Act 2022 can now obtain Breeders of Species Licence.

9.12 Ethanol 100

India commenced the sale of Ethanol 100 across 183 Indian Oil outlets in Maharashtra, Karnataka, Uttar Pradesh, New Delhi, and Tamil Nadu.

Ethanol

- Ethyl alcohol or [Ethanol](#) (C_2H_5OH) is a biofuel that is naturally made by fermenting sugar.
- It is basically 99.9% pure alcohol that can be blended with petrol.
- While it is mostly derived from sugarcane, other organic matter like food grains can also be used for their production.
- Most of the ethanol production in India comes from B Heavy Molasses.

- **Significance** - Ethanol 100 stands as a cleaner, greener alternative to gasoline.
- Ethanol 100 has lower emissions of greenhouse gases and pollutants, thus aiding in combating climate change and enhancing air quality in our communities.
- With its **high-octane rating**, typically between 100-105, it proves ideal for high-performance engines, ensuring improved efficiency and power output all while minimizing environmental impact.
- **Applications** - [Ethanol](#) 100 can be used in a wide array of vehicles, including flex-fuel vehicles (FFVs) designed to run on gasoline, ethanol, or any blend of the two.

Ethanol 20 (E20) programme aims to achieve 20% ethanol blending in petrol by 2025. Currently, 8.5% of ethanol is blended with petrol in India.

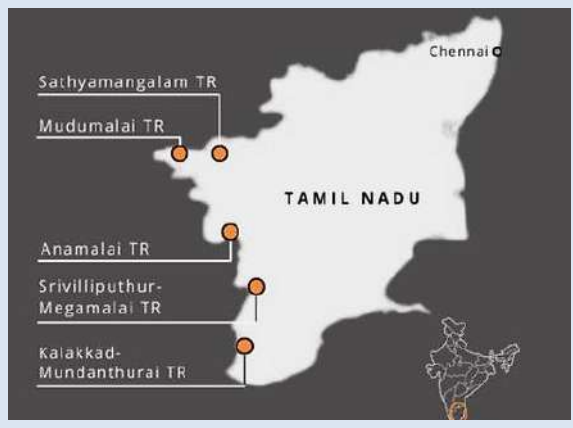
9.13 Land acquisition for Tiger Reserve (TR)

In a first, the Tamil Nadu forest department has acquired 30.41 acres of erstwhile private patta land, situated in the core area of Srivilliputhur Megamalai Tiger Reserve (SMTR).

- The land was acquired through private negotiation under the [Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013](#).
- A sum of Rs 2.33 crore was paid to seven land owners, who volunteered to surrender their land.
- This is the **first time in India** where the state government has purchased private land for non-commercial use towards forest and biodiversity conservation.

Srivilliputhur Megamalai Tiger Reserve (SMTR)

- The SMTR is located across the Madurai, Virudhunagar and Teni districts of Tamil Nadu.
- SMTR came into being in 2021, making it the youngest of the five tiger reserves in the state and India's 51st Tiger Reserve.

Tiger reserves in Tamil Nadu	Established in	
Kalakkad-Mundanthurai	1988	
Mudumalai	2007	
Anamalai	2008	
Sathyamangalam	2011	

- The land acquired by the state government is locally known as Yegan Raja Board.
- The titular Yegan Raja had been a lumberjack who assembled a sizable crew to work for British officers.

- He had exploited the forests for British officers, who in return arranged lands for him from the Gandamanur zamindar.
- The land has been passed on to various others since then.

9.14 Captive Elephant (Transfer or Transport) Rules, 2024

The Centre has notified a set of rules called the Captive Elephant (Transfer or Transport) Rules, 2024 that liberalise the conditions under which elephants may be transferred within or between states.

- **Released by** – The [Ministry of Environment Forest and Climate Change](#).
- Until August 2022, the [Wildlife Protection Act](#) explicitly prohibited the trade in wildlife including both wild and captive elephants.
- However [amendments](#) to the [Act](#) brought in an exemption that for the first time allowed captive elephants to be transferred.
- **Rules** – Captive [elephants](#) can be transferred when an owner is no longer in a position to maintain the [elephant](#), the [elephant](#) will likely have a better upkeep than in the present circumstances.
- **Chief Wildlife Warden** – Otherwise, when a state's Chief Wildlife Warden deems it fit and proper in the circumstances of the case for better upkeep of the [elephant](#).
- Before a transfer within the state, an elephant's health has to be ratified by a veterinarian and the Deputy Conservator of Forests must establish that the animal's current habitat and prospective habitat are suitable.
- The Chief Wildlife Warden on receipt of such documents may choose to reject or approve the transfer.
- If the transfer involves moving the elephant outside of a state, similar conditions apply.
- **Genetic profile** – Before a transfer is effected, the [genetic profile](#) of the [elephant](#) has to be registered with the Ministry of Environment, Forest and Climate Change.

Elephant exemption

- The elephant being transferred ought to be accompanied by a mahout and an elephant assistant
- A health certificate from a veterinary practitioner to the effect that the elephant is fit for transport and is not showing any sign of musth or infectious or contagious disease, is to be obtained
- The transport shall be carried out after the mandatory quarantine period as advised by the veterinary practitioner is over, in case of contagious disease
- The elephant shall be properly fed and given water before loading
- Necessary arrangements shall be made to provide food and water to the elephant en route
- Tranquilisers/sedatives shall be used to control nervous or temperamental elephants upon prescription by the veterinary practitioner.
- **Committee** – A Parliamentary Committee, led by Congress Rajya Sabha MP, Jairam Ramesh, had recommended the deletion of this exemption clause for elephants.
- It also recommended providing only an exemption for elephants owned by temple trusts.
- **Final Version of the Act** – The final version of the amended act, however retains the clause on allowing the movement of captive elephants.
- However only animals with an existing certificate of ownership may be moved.

The government of India in 2010 declared Elephant as the national heritage animal of the country on the recommendations of the standing committee of the national board for wildlife.

9.15 Moyar Valley

Moyar valley is the home of critically endangered Gyps Vulture.

- **Other name** – Maayar (Invisible River) valley.
- **Location** – It extends from Gudalur through the core area of Mudumalai Tiger Reserve.

It is the only region in peninsular India which has the biggest nesting colony of Gyps vultures in the wild.

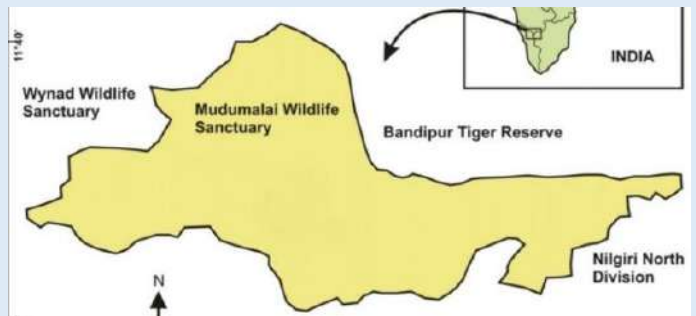
- **Biome** – The valley is an important biome in the Nilgiri Biosphere Reserve, sheltering several vital species like tiger and elephant and the critically endangered Gyps vulture.
 - A biome is an area classified according to the species that live in that location.
- **NSAIDs** – The region provides a stable food-chain to nature’s scavengers, simply because these carcasses are mostly free from Non-steroidal anti-inflammatory drugs (NSAIDs) and other poisonous chemicals.
- **Resident Vultures of Moyar Valley** – White Rumped vultures, Long Billed vultures, Red Headed vultures, and Egyptian vultures.

Nilgiri Biosphere Reserve

- The Nilgiri Biosphere Reserve was the first biosphere reserve in India established in the year 1986.
- It is located in the Western Ghats and includes 2 of the 10 biogeographical provinces of India.
- The Nilgiri Biosphere Reserve encompasses parts of TamilNadu, Kerala and Karnataka.
- The Nilgiri Biosphere Reserve falls under the biogeographic region of the Malabar rain forest.
- The [Mudumalai Wildlife Sanctuary](#), [Wayanad Wildlife Sanctuary](#), [Bandipur National Park](#), [Nagarhole National Park](#), [Mukurthi National Park](#) and Silent Valley are the protected areas present within this reserve.

Mudumalai Tiger Reserve (MTR)

- Mudumalai Tiger Reserve (MTR) is located in the Nilgiri District of Tamil Nadu.
- It is at the tri-junction of Karnataka, Kerala and Tamil Nadu.
- The Tiger Reserve comprises of the wildlife sanctuary and the national park of the same name.
- It forms a part of the Nilgiris Biosphere Reserve.
- It has a common boundary with Wyanad Wildlife Sanctuary (Kerala) on the West, Bandipur Tiger Reserve (Karnataka) on the North.
- The Moyar River flows downstream into the Mudumalai Tiger Reserve and is the natural line of division between Mudumalai and Bandipur Sanctuary.



Vultures

- Nine species of vultures are recorded from India and out of these, five belong to the genus Gyps and the rest four are monotypic.

Gyps	Monotypic
<ul style="list-style-type: none"> • The Oriental White-backed Vulture (OWBV) Gyps bengalensis, • The Long-billed Vulture (LBV) G.indicus, • Slender-billed Vulture (SBV) G. tenuirostris, • The Himalayan Vulture (HV) Gyps himalayensis and • The Eurasian Griffon (EG) Gyps fulvus. 	<ul style="list-style-type: none"> • The Red-headed Vulture (RHV) Sarcogyps calvus, • Egyptian Vulture (EV) Neophron percnopterus, • Bearded Vulture (BV) Gypaetus barbatus and • Cinereous Vulture (CV) Aegyptius calvus

- The Gyps Vultures faced near extinction owing to the use of diclofenac, which the Government of India banned for veterinary use in 2006.

Vultures of India

This poster depicts the nine species of Vultures reported from India and their identification features along with their IUCN RedList Status



White-rumped Vulture
Gyps bengalensis



Slender-billed Vulture
Gyps tenuirostris



Indian Vulture
Gyps indicus



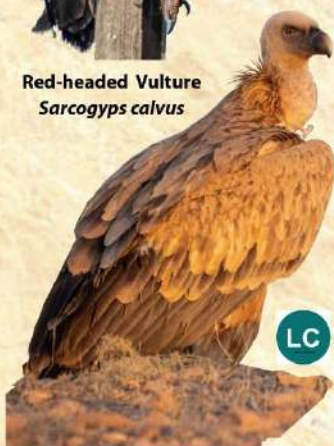
Red-headed Vulture
Sarcogyps calvus



Bearded Vulture
Gypaetus barbatus



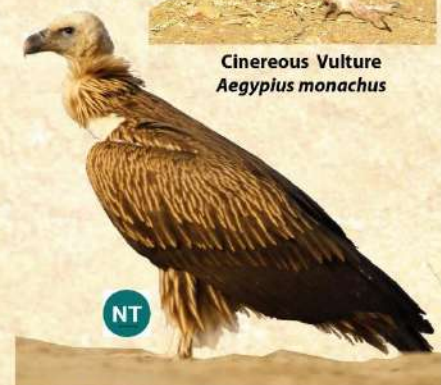
Cinereous Vulture
Aegypius monachus



Griffon Vulture



Egyptian Vulture
Neophron percnopterus



Himalayan Griffon
Gyps himalayensis

9.16 Financing Agrochemical Reduction and Management Programme (FARM)

Ecuador, India, Kenya, Laos, Philippines, Uruguay, and Vietnam have joined forces to launch a \$379 million initiative in order to reduce the environmental impact of the agricultural sector.


- **Led by** – FARM is led by the UN Environment Programme (UNEP) with financial support from the Global Environment Facility (GEF).
- **Tenure** – 5 years.

- **Objective** – FARM programme will support government regulation to phase out POPs-containing agrochemicals and agri-plastics and adopt better management standards.
- FARM will also strengthen banking, insurance and investment criteria to improve the availability of effective pest control, production alternatives and trade in sustainable produce.

Highly hazardous pesticides and agricultural plastics release toxic persistent organic pollutants (POPs), chemicals which don't break down in the environment and contaminate air, water, and food.

United Nations Environment Programme (UNEP)

- UNEP is the leading global environmental authority that sets the global environmental agenda.
- **It works on 7 thematic areas** – Climate change, Disasters and conflicts, Ecosystem management, Environmental governance, Chemicals and waste, Resource efficiency, and Environment under review.
- **Reports** – Global Environment Outlook, Emission Gap Report, Adaptation Gap Report, Actions on Air Quality & Rise of Environmental Crime Report (along with INTERPOL)
- **UNEA** – The UN Environment Assembly is the world's highest-level decision-making body on the environment which brings together representatives to address the world's most pressing environmental challenges.

UNEP		
Founded in	1972	
Headquarters	Nairobi, Kenya	
India's membership	India is a member	

Global Environment Facility (GEF)

- The Global Environment Facility (GEF) is a multilateral family of funds dedicated to confronting biodiversity loss, climate change, and pollution, and supporting land and ocean health.
- Its financing enables developing countries to address complex challenges and work towards international environmental goals.
- The partnership includes 186 member governments as well as civil society, Indigenous Peoples, women, and youth, with a focus on integration and inclusivity.
- Over the past three decades, the GEF has provided nearly \$25 billion in financing and mobilized another \$138 billion for thousands of priority projects and programs.
- The family of funds includes:
 1. Global Environment Facility Trust Fund,
 2. Global Biodiversity Framework Fund (GBFF),
 3. Least Developed Countries Fund (LDCF),
 4. Special Climate Change Fund (SCCF),
 5. Nagoya Protocol Implementation Fund (NPIF),
 6. Capacity-building Initiative for Transparency Trust Fund (CBIT)
- **India** – India has formed a permanent Constituency in the Executive Council of the GEF together with Bangladesh, Sri Lanka, Bhutan, Nepal and Maldives.

9.17 Black Carbon

At the COP26 climate talks in Glasgow in November 2021, India pledged to achieve net-zero emissions by 2070, positioning itself as a frontrunner in the race to carbon neutrality.

- Black carbon is the dark, sooty material emitted alongside other pollutants when biomass and fossil fuels are not fully combusted.
- It contributes to global warming and studies have found a direct link between exposure to black carbon and a higher risk of heart disease, birth complications, and premature death.

According to the Ministry of New and Renewable Energy, India had installed a renewable energy capacity of over 180 GW by 2023 and is expected to meet its target of 500 GW by 2030.

- Most black carbon emissions in India arise from burning biomass, such as cow dung or straw, in traditional cook stoves.
- According to a 2016 study, the residential sector contributes 47% of India's total black carbon emissions.

Other Colored Carbons

- Scientists use color to classify carbon at different points in the carbon cycle based on carbon function, characteristics, and location.
- **Blue** – Carbon stored in ocean plants and sediments.
- This carbon is captured by living organisms in oceans and is stored in the form of aquatic biomass.
- Seagrasses, mangroves, and marshes are types of vegetated coastal blue carbon ecosystems, these habitats have a cover of approximately 49 million hectares worldwide.
- Blue carbon ecosystems act as the major sink for capturing atmospheric carbon and reducing warming effects.
- **Green** – Carbon stored in terrestrial plants.
- Green carbon reflects the carbon sequestered by land ecosystems and incorporates carbon in soils and within biomass such as trees in forests.
- **Brown** – Carbon released by incomplete combustion of organic matter.
- It coexists with black carbon when released into the atmosphere.
- It also changes the solar absorption pattern and the nature of clouds.
- **Red** – Carbon released through biological particles on snow and ice that reduce albedo.
- **Gray** – Carbon released through industrial emissions.
- **Teal** – Carbon stored in freshwater and wetland environments.
- **Purple** – Carbon captured through the air or industrial emissions.



9.18 Decision Support System (DSS)

The decision support system (DSS), which identifies sources of pollution in Delhi's air, will resume functioning from September this year with some new features.

- **Developed By** – DSS was developed by Indian Institute of Tropical Meteorology (IITM) Pune.
- **Model** – DSS is a numerical model-based framework to forecast Delhi's air quality and sources of local and regional pollution which can impact the air.
- **Utility** – The system gives forecasts the result of biomass burning activities in neighbouring states.

Delhi's air quality index (AQI) worsened to 325 from 303 a day ago, both in the very poor category, showed data from the Central Pollution Control Board (CPCB).


- DSS enhances [Delhi's air quality](#) forecasting with updated 2023 emission inventory and VIIRS satellite for PM_{2.5} predictions.
- The system works only in winter and is stopped from March to August, currently forecasts the contribution of emissions in [Delhi's air quality](#) from 19 neighbouring districts.
- Now, the system will also forecast how [Delhi's emissions](#) impact the air of eight surrounding districts in NCR.
- The emissions inventory currently being used was last updated in 2018, however DSS has now received an updated emission inventory of 2023.
- The two models, System of Air Quality and Weather Forecasting And Research (Safar) and DSS, had temporarily stopped sharing data on air pollution for the country as there were differences between their forecasts and source contribution.

What is decision support system (DSS)

- > It's a numerical model-based framework to identify sources of particulate matter in Delhi's air
- > Currently halted, the model will resume functioning from Sept this year
- > A new feature from this winter

will show how much emissions from Delhi will impact air quality of neighbouring districts

- > The system has also got an updated emission inventory, which will help improve the forecast related to Delhi's air quality



DSS CURRENTLY FORECASTS CONTRIBUTION OF

1 Emissions from Delhi and the surrounding 19 districts adding to Delhi's air quality

2 Emissions from eight different sectors of Delhi that affect air quality

3 Biomass-burning activities in neighbouring states that degrade Delhi's air quality

It also forecasts effects of interventions at emission source levels on a severe air-quality event in Delhi

Air Quality Index (AQI)	System of Air Quality and Weather Forecasting and Research (SAFAR)
<ul style="list-style-type: none"> • AQI is a number used to communicate to the public how polluted the air currently is or how polluted it is forecasted to become. • As AQI increases, an increasingly large percentage of the population is likely to experience increasingly adverse health effects. • Different countries have their own air quality indexes, corresponding to different national air quality standards. • The AQI is most commonly used to describe ground-level ozone levels. • However, the AQI can be used to represent five pollutants that pose a threat to human health. • These pollutants are: <ol style="list-style-type: none"> 1. Ground-level Ozone or O₃ 2. Particulate Matter (soot and dust) or PM 3. Carbon Monoxide or CO 4. Sulphur Dioxide or SO₂ 5. Nitrogen Dioxide or NO₂ 	<ul style="list-style-type: none"> • SAFAR is an exceptional program to reduce air pollution in India and to improve the air quality index of metropolitan cities. • SAFAR is the first advanced air quality early warning system in India, introduced by the Ministry of Earth Sciences (MoES). • SAFAR provides location specific information on air quality in near real time and it is forecasted upto 3 days in India. • SAFAR was developed by the Indian Institute of Tropical Meteorology (IITM), Pune.

Other Important Topics

Cheetah Conservation Breeding Centre

- **Gujarat** is setting up India's 1st cheetah conservation breeding centre in Banni Grasslands Reserve.
- The **Banni Grasslands Reserve** is an arid grassland ecosystem in the Kutch district of Gujarat.
- It's one of the **largest grasslands in India and the largest in Asia.**

India's 1st Green Hydrogen plant in stainless steel sector

Union Minister for Steel and Civil Aviation recently inaugurated India's 1st Green Hydrogen Plant in Stainless Steel Sector in Haryana.

- It will be the world's 1st off-grid Green Hydrogen plant for the stainless-steel industry and the world's 1st Green Hydrogen plant with rooftop & floating solar.
- This project's target is to reduce carbon emissions by around 2,700 Metric Tonnes per annum and 54,000 tons of CO₂ emissions over next 2 decades.
- Green hydrogen refers to hydrogen produced from water electrolysis, splitting water into hydrogen and oxygen by using renewable energy-powered electrolyzers.

Serengeti ecosystem

- The Serengeti ecosystem is a protected area in **Africa** that stretches from Tanzania to Kenya.
- It is composed of the Serengeti National Park, the Maasai Mara in Kenya, and several smaller protected areas.
- It's a tropical savanna dominated by grass. Thorny acacia trees are sparsely scattered in the grassland.
- The region hosts the largest mammal migration in the world.

Aghanashini Estuary

- The Aghanashini estuary located in **Karnataka** where the **Aghanashini River** flows into the Arabian Sea.
- It was recently designated as **Ramsar sites** under the Ramsar Convention.

Old-growth forests

- Old-growth forests are forests that have developed over a **long period of time without disturbance**.
- They are also known as primary forests, virgin forests, primeval forests, late seral forests, or ancient woodlands.
- They are exceptionally valuable as they tend to host more species, store more carbon, and are more resilient to environmental change.
- Forests cover approximately 31% of the total global land area out of which roughly one-third is old-growth forest.
- More than half of the world's old-growth forests are found in **Brazil, Canada, and Russia**.
- Examples of old-growth forests - California redwoods, Tongass National Forest in Alaska, and Adirondack forests in New York.

Clear-cutting is the practice of cutting down most or all of the trees in a forest at once.

Bannerghatta Biological Park

- Bannerghatta Biological Park is a sanctuary located in **Bengaluru, Karnataka**.
- It is the **1st biological park in India** to have a fenced forested elephant sanctuary.
- In 2006, **India's first butterfly enclosure** was inaugurated at the park.
- **The Suvarnamukhi stream** runs through the national park.

Mathikettan Shola National Park

- Mathikettan Shola National Park is a national park in **Kerala established in 2003**.
- It shares an interstate boundary with **Kerala and Tamil Nadu**.
- It is originally a part of the **Cardamom Hill Reserve (CHR)**, serve as perennial water sources for several tributaries of the **Panniyar river**.
- Mathikettan Shola National Park is known for its **pristine shola forests**, unique montane evergreen forests found in the Western Ghats.

Valmiki Tiger Reserve (VTR)

- Valmiki Tiger Reserve (VTR) is the **only tiger reserve** situated in **Bihar**.
- The VTR was established in 1990 and declared a Wildlife Sanctuary in 1978.
- VTR comprises of the Valmiki National Park and Valmiki Wildlife Sanctuary.
- VTR is located on the banks of the **Gandak river**, at the **India-Nepal border** and the easternmost limit of the **Himalayan Terai forests**.
- VTR boundary in the north borders **Royal Chitwan National park (World Heritage Site) and Parsa wildlife sanctuary of Nepal**.
 - The Bihar government is waiting to obtain NTCA approval for declaring Kaimur Wildlife Sanctuary as the state's 2nd tiger reserve after VTR.

Arsenic Contamination

A new study highlighted that 32% of the global population lives in low- and middle-income countries that do not adhere to the World Health Organization's recommended limits of Arsenic in water.

- **Arsenic contamination**- Arsenic is highly toxic in its inorganic form and can be found in high levels in the groundwater of several countries.
- Rice contains more arsenic in comparison to other cereals. Rice contains inorganic arsenic (iAs), a Group 1 carcinogen.
- Prolonged exposure of arsenic can lead to even **diabetes and cardiovascular diseases**.
- **WHO recommendation** - The World Health Organization (WHO) recommends that drinking water contain no more than **10 micrograms of arsenic per liter (µg/L)**.
- India adopts 10 parts per billion as its standard.

Orans, Dev vans, Runds

Rajasthan recently notified to recognize orans, dev vans and runds as deemed forests has sparked fear among community dwellers.

Types	Description
Orans	<ul style="list-style-type: none"> • Community-preserved sacred groves in Rajasthan, also known as "virgin" forests. • Found in - Aravali Mountain Range and the Great Indian Desert of Rajasthan.
Dev vans	<ul style="list-style-type: none"> • These are sacred forests that perform ecological functions such as water recharging, nutrient cycling, biodiversity conservation, and preventing soil erosion.
Runds	<ul style="list-style-type: none"> • Traditionally conserved open forests.

- **Deemed forests** are areas of land that appear to be forested but are not officially classified as such in government or revenue records.
- In India, deemed forests account for about 1% of total forest land.

Sacred groves in India

Sacred groves are patches of primeval forest that some rural communities protect as abodes of deities and it helps in the protection of many rare, threatened and endemic species of plants and animals in the area.

Sacred groves	Location
Sarpakavus	Kerala

Devakadu	Karnataka
Nandavanam, Kovilkadu	Tamil Nadu
Devarais	Maharashtra
Pavithraskhetralu	Andhra Pradesh
Law kyntangs	Meghalaya
Khejri	Rajasthan

Kuttanad Ecosystem

- Kuttanad is a delta region situated in the west coast of ***Kerala***.
- The Kuttanad Below Sea-level Farming System (KBSFS) is the ***only system in India that practices rice cultivation below sea level***.
- The rice fields, which are popularly known as "***Puncha Vayals***" exist in 3 landscape elements:
 1. **Karapadam** (upland rice fields)
 2. **Kayal** (wetland rice fields)
 3. **Kari** (land buried with black coal like materials)
- The KWS is part of the larger ***Vembanad Kol wetland ecosystem***, which is a Ramsar Site.

Eturnagaram Wildlife Sanctuary

Telangana is presently grappling with forest fires in Tadvai region of Eturnagaram Wildlife Sanctuary in Mulugu and Amrabad Tiger Reserve.

- The vegetation here is tropical dry deciduous.
- The sanctuary is bordered by the ***Laknavaram Lake***.
- The perennial river ***Dayyam Vagu*** flows through this sanctuary.
- The sanctuary is also famous for the ***Sammakka Saralamma Jatara***, a tribal festival for honouring the goddesses' Sammakka and Saralamma.

SPECIES IN NEWS

9.19 Gangetic River Dolphin

Recently, National Dolphin Research Centre (NDRC) was inaugurated in Patna in Bihar.

- It is ***India's 1st centre for research*** on conserving the Gangetic river dolphin.
 - **Scientific name** – Platanista gangetica gangetica
 - **Common name** – Susu, Shushak, Side-swimming Dolphin
- **Distribution** – They are ***endemic to River Ganga***.
- Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems of ***Nepal, India, and Bangladesh***.
- **Habitat** – ***Only freshwater*** and prefer ***deep water***, live in a zone of little or no current.
- **Features** – It is ***functionally blind*** and finds its way and prey in river waters through ***echolocation***.
- Being a mammal, it ***cannot breathe in water*** so it surfaces above the water every 30-40 seconds to breathe with a slit similar to a blowhole on top of its head acts as a nostril.
- They are frequently found ***alone or in small groups***, and generally a mother and calf travel together.

Bihar has around 50% of the estimated 3,000 Gangetic dolphins in India.

- Calves are chocolate brown at birth and then have *grey-brown smooth, hairless skin* as adults.
- Females are larger than males.
- **Major Threats** – Unintentional killing through entanglement in *fishing gear, pollution and overexploitation of prey*.
- *Poaching* for dolphin oil, used for medicinal purposes.
- *Habitat destruction* due to development projects like dams.
- **Protection status**
 - IUCN – Endangered
 - **Wild Life (Protection) Act** – Schedule I
 - CITES – Appendix I

Gangetic River Dolphin	
•	The Gangetic river dolphin is one of 4 freshwater dolphin species in the world. The other 3 are found in the Yangtze River in China (now extinct), the Indus River in Pakistan and the Amazon River in South America.
•	It is <i>India's national aquatic animal</i> and <i>state aquatic animal of Uttar Pradesh</i> .
•	It was recently <i>rescued in Jalaka River of Odisha</i> , which indicates that there is presence of more freshwater dolphins in the river.
•	<i>Project Gangetic Dolphin</i> was launched in 2016 for conserving it.

9.20 Asiatic Lions

The International Union for Conservation of Nature (IUCN) recently recategorized the Asiatic lion status as **vulnerable** from endangered indicating a positive shift in its conservation status.

Nomenclature change

- Due to genetic similarity between Central African, West African and Asiatic Lions, IUCN has clubbed all three under **Panthera leo leo**.
- Earlier, the Asiatic lions were classified as *Panthera leo persica*.

Asiatic Lions

- The Asiatic lion is a subspecies of lion, slightly smaller than African lions.
- They are also known as **Persian lions or Indian lions**.
- **Scientific Name** - Panthera leo leo.
- **Family** – Felidae.
- **Distribution** - They used to range from Turkey, across Asia, to eastern India.
- **Habitat** - At present **Gir National Park, Gujarat** is the only abode of the Asiatic lion.
- They are one of the 5 [big cats](#) found in India and are better known as ‘the king of beasts’.

Conservation Status	
IUCN	Vulnerable
WPA	Schedule I
CITES	Appendix I

Project Lion

- The Project Lion envisages landscape ecology-based conservation of the Asiatic Lion in Gujarat by integrating conservation and eco-development.
- The Project is being implemented in the *Gir landscape in Gujarat* which is the last home of the Asiatic lion.
- **Implementation** - The State Government of Gujarat and other stakeholders like Central Zoo Authority.

9.21 Netted in illegal wildlife trade: Sharks of India

A new analysis ‘Netted in illegal wildlife trade: Sharks of India’ reports that, Tamil Nadu tops illegal trade in shark body parts.

- **Published by** – TRAFFIC and WWF-India
- **Study period** – 2010 to 2022
- **Key findings** – About 16,000 kg of shark fins were seized in this period, constituting almost 80% of the shark-derived products.
- **Tamil Nadu** tops with almost 65% of the illegal trade in shark body parts followed by Karnataka, Gujarat, Kerala, and Maharashtra.

India is the 3rd largest shark-producing nation in the world according to a 2019 report by TRAFFIC.

- **Usage** – Shark-fin soup as a delicacy, meat as food, skin as leather, liver oil (*squalene*) as a lubricant, in cosmetics and as a source of vitamin A, cartilage for *chondroitin sulphate extraction* for preparing medicines while jaws and teeth for making curios.
- **Measures** – TRAFFIC has created *3D-printed and painted replica* fins and also published a new *3D Shark Fin Identification Guidebook* on 11 shark and ray species.
- These 11 species are listed in Appendix II of [CITES](#) (Convention on International Trade in Endangered Species of Wild Fauna and Flora).

Sharks

- Cartilaginous fishes of predatory habit that constitute the order Selachii, class Chondrichthyes and subclass elasmobranchii.
- **Uniqueness** – Their fossil records date back 400 million years, outliving the dinosaurs and many other forms of life currently on earth.
- They are the top predators in the oceanic food web.
- **Ampullae of Lorenzini** are electrosensitive organs that, together with the olfactory organs, form the main sensory systems for foraging and navigation in skates, rays, and sharks.
- **Habitat** - Deep and shallow waters throughout the world's ocean.
- **Feed** – Plankton, fish, crustaceans, and marine mammals.
- **Threat** – Overfishing, Low biological productivity.
- **In India** – There are about 160 shark species.
- **Conservation status**
 - **Wild Life (Protection) Act of 1972** – 26 sharks and rays out of 160 species have been listed in Schedules I and II.
- **Measures** – India has banned the live finning of sharks and the export of fins of all shark and ray species.
- 10 species are completely protected from any fishing and trade.
 - *Whale sharks are the largest fish species on Earth.*

Quick Facts

- **TRAFFIC** – Trade Records Analysis of Flora and Fauna in Commerce, a wildlife trade monitoring network.
- Established in – 1976 by WWF and IUCN, and became an independent non-profit organization in 2017.
- Aim – To undertake data collection, analysis, and provision of recommendations to inform decision making on wildlife trade.
- **WWF-India** – World Wide Fund for Nature India
- Established in – 1969, as a Charitable Trust.
- Aim – To reduce the degradation of Earth's natural environment and building a future in which humans live in harmony with nature.

9.22 Bugun Liocichla

Arunachal Bugun Tribe donates land for critically endangered songbird Bugun Liocichla.

- A small babbler bird (only 20 cm) with olive-grey plumage and black cap.
- It was the first bird to be discovered in India since its independence, in 2006
- It is found only in the Eaglenest Wildlife Sanctuary and nowhere else in the world.
- The bird was identified by Ramana Athreya, a Pune-based astrophysicist.
- The avian species is critically endangered with only 14 individual birds spotted so far in the Braiduah village under the Singchung sub-division.



- As a major step towards conservation, the [Arunachal Pradesh](#) government finally notified Braiduah [Community Reserve](#) under the Wildlife Protection Act, 1972.
- The reserve is situated adjacent to the Eaglenest Wildlife Sanctuary.

Bugun Tribes

- **From** – The Khowa tribe, also known as Bugun people, of western Arunachal Pradesh bordering [Bhutan](#) is one of India's smallest tribal communities.
- **Language** – They speak Kho-Bwa language, which is derived from the words 'Kho' meaning fire and 'Bwa' for water, hence the name Khowa.
- Their language is similar to Mey language of the neighboring Sherdukpen tribe, with who they coexisted peacefully in the mountains.
- **Race** – The Buguns are of Mongoloid race and they believe to have descended from a mythical tribe Achinphumphulua.
- **Endogamous** – Buguns are generally endogamous as they marry within their community.

9.23 Vechur Cow

Dr. Sosamma Iype won the Padma Shri in 2022 for saving and resurrecting a breed of indigenous cattle, the Vechur Cow.

- The Vechur Cow is acknowledged as one of the world's smallest cattle breeds, is [indigenous](#) to the Vechur village in Kerala.
- **Characteristics** – Typically, 90 cm tall and one-metre-long, Vechur cows demand very little food and no special care.
- The milk was rich in fat, and the variety was tolerant to heat and resistant to most diseases, including the foot-and-mouth disease.
- Vechur Cow can easily survive in adverse climates.
- **Extinct** – The milk revolution of the 1950s accompanied by a crossbreeding whip from the government, had started wiping out native cow breeds.
- In Kerala, a livestock improvement act was passed in 1961, and it declared possession of native breeds of cows as illegal.
- Across the state, Vechur cows were extensively inseminated with exotic bulls.
- The Vechur experiment prompted the conservation of 28 native breeds which were on the verge of extinction, and they include Sikkim's small and short-legged Siri cow and the Tharparkar of Rajasthan's Thar Desert.



Thenmala Kullan

- Thenmala Kullan, the dwarf cow comes with many distinctive features, including a small hump.
- Reared by tribespeople in Arippa and Thenmala, they are less docile and basically thrive on forest-based fodder from nearby oil palm estates.
- Though they produce nutrient-rich A2 milk, quantity is very low and are reared mainly for calves and manure.
- Kerala Animal Husbandry department plans to register 'Thenmala Kullan' as indigenous breed.

Indigenous cow breeds include Gir, Sahiwal, Rathi, Deoni, Kankrej, Tharparkar, Red Sindhi, Kangeyam, Ongole, etc and Indigenous buffalo breeds include Murrah, Jaffrabadi, Pandharpuri, Mehsana, etc.

9.24 Star Tortoise

A new study shows that wild populations of Indian star tortoises, exist as two genetically distinct populations, one in northwestern India and the other in southern India.

- **Scientific name** – Geochelone elegans

- Star Tortoises have a distinct star-like markings on the shell.
- **Habitat** – It is endemic to the Indian subcontinent and inhabits two disjoined arid regions, northwestern India (including parts of Pakistan) and southern India (including parts of Sri Lanka).
- In India, they are found in six states Gujarat, Karnataka, Punjab, Tamil Nadu, Kerala and parts of Odisha.
- **IUCN Status** – According to the IUCN Red List, the Indian Star Tortoise is a vulnerable species.
- **CITES** – CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) listed it under Appendix I, the list of most endangered species.



- India has started creating a genetic database of the Indian Star Tortoise.
- Prior to this, similar genetic databases have been created and effectively used to protect tigers and rhinos in India.
- Integrating genetic information into the management of this highly trafficked species could help in evidence-based conservation and better rehabilitation decisions for seized tortoises.

- **Threats** – The species is facing twin challenges of a threat to its habitat at one level and loss of its genetic diversity at the other.
- Rampant illegal trade has caused major losses of the Indian Star Tortoises.
- Unscientific translocations that have resulted in genetic mixing between different populations.

9.25 Whales and Effects of Entanglement

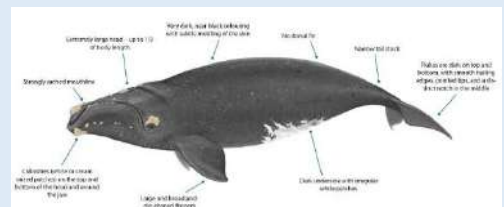
Researchers have found that the female right whales may never breed after entanglement in a fishing gear.

Right Whales

- The species' name originates from the fact that whalers considered right whales the right whale to hunt.
- **Characteristics** – These whales yielded high quantities of oil and baleen, and were easy to catch and process because they were found close to shore, swam slowly, and floated when they were dead.
- **Types** – There are three recognized species of right whales that occur in different parts of the world.
- These are Southern right whales (*Eubalaena australis*), North Atlantic right whales (*Eubalaena glacialis*) and North Pacific right whales (*Eubalaena japonica*).
- The North Atlantic right whale is one of the world's most endangered large whale species.

North Atlantic right whales are legally protected, both internationally and in U.S. waters.

- The North Pacific right whale is found in the North Pacific Ocean, and the Southern right whale is found in the southern hemisphere.
- **Differ** – While they differ genetically, and in conservation status, they do not differ significantly in their external appearance.
- **IUCN Status** –
 1. **Southern right whales** – Least Concern.
 2. **North Atlantic right whales** – Critically Endangered.
 3. **North Pacific right whales** – Endangered.



Effects of Entanglement

- **Entanglement** – The [entanglement](#) of marine mammals, is considered a type of bycatch.
- It occurs when fishing gear and marine debris become wrapped around the animal, weighing it down or hampering its movement, often leading to the animal's death, or serious welfare issues.
 - The different types of fishing gears includes ropes, buoys, nets, and fish aggregating devices.

- **Effects** – Entangled animals may drown or starve because they are restricted by fishing gear, or they may suffer physical trauma and infections from the gear cutting into their flesh.
- Entangled animals may also be unable to avoid vessels like they normally would, thus increasing the risk of vessel strikes.
- Smaller marine animals, like sea turtles, seals, porpoises, dolphins, and smaller whales, may drown immediately if the gear is large or heavy.
- **Impact on Whales** – When whales become entangled in fishing gear, they use extra energy dragging it as they swim.
- If the rope is caught around their mouths, they may struggle to feed and slowly starve.
- Ropes wrapped around whales' bodies, flippers or tails can cut into the animals' skin and become deeply embedded in their flesh, as happened to whale.
- This can cause infections, chronic emaciation and damage to whales' blubber, muscle, bone and baleen, the bristly structures in their mouths that they use to filter prey from the water.
- **Breeding** – Even when entanglement does not kill a whale, it can affect their ability to reproduce, which is critically important for a species with such low numbers.
- North Atlantic right whales historically started breeding by around 9 years of age and gave birth to a single calf every three to four years thereafter for several decades.
- North Atlantic right whales historically started breeding by around 9 years of age and gave birth to a single calf every three to four years thereafter for several decades.
- Entanglement is attributed to the low calving rates in North Atlantic right whales' decline.

Research suggests that over 300,000 whales and dolphins die annually due to entanglement in fishing gear, with additional unknown numbers also entangled in marine debris.



9.26 Brucethoa isro

New species of deep-sea isopod discovered off Kollam, Kerala named after ISRO.

Crustacean

- Crustaceans are a group of invertebrate animals and make up a very large group of the Arthropods.
- Mostly they are free-living freshwater or marine animals (e.g. Crabs, lobsters, shrimps) but some are terrestrial (e.g. woodlice), some are parasitic (e.g. fish lice) and some do not move (e.g. barnacles).
- They have a hard exoskeleton (carapace), a segmented body that is bilaterally symmetrical, more than four pairs of jointed appendages and an open circulatory system.
- Gills are used for respiration and a pair of green glands are used to excrete wastes.
- Amphipods do not have a carapace and also serve as indicators for studying the impact of climate change and health of coastal ecosystem.

The major groups of Crustaceans

- **Genus** – The tiny fish-parasitic crustacean, belonging to the genus Brucethoa, was recovered from the base of the gill cavity of the Spinyjaw greeneye, a marine fish.
- The new species was identified by the same team that had in 2020 described Brucethoa as a new genus from India.
- The new species has been named Brucethoa isro in honour of the Indian space agency's successful space missions, including the successful lunar mission titled Chandrayaan-3.

- **Features** – Females of the *Brucethoa isro* species tend to be larger than the males.
- Females grow to about 19 mm in length and 6 mm in width, while males are smaller at around half the size.
- The distinctive morphology and behaviour of deep-sea parasitic isopods have long intrigued taxonomists.
- *Brucethoa isro* is the second species within this genus to be documented in India.

Isopods

- Isopods are an order of invertebrates (animals without backbones) that belong to the greater crustacean group of animals, which includes crabs and shrimps.
- They are one of the most morphologically diverse of all the crustacean groups, coming in many different shapes and sizes and ranging from micrometers to a half meter in length.
- They also live in many different types of habitat, from mountains and deserts to the deep sea, and they are distributed worldwide.
- Isopods often do not look alike, but they do have common features.
- All isopods have two pairs of antennae, compound eyes, and four sets of jaws.
- The body, or pereon, of all isopods consists of seven segments, each with its own pair of walking legs.
- Isopods have a short abdominal section composed of six segments, called pleons, and one or more of these segments is fused into a tail section.

9.27 Great Indian Bustard (GIB)

The Supreme Court constituted an expert committee to determine the scope, extent and feasibility of electric lines in priority spots of Great Indian Bustard.

- **Scientific Name** – *Ardeotis nigric*
- Locally called **Godawan**, GIB is a large bird of the bustard family (Otididae) and one of the heaviest flying birds in the world.
- They are not great fliers but have wide sideways vision to maximise predator detection.
- Great Indian Bustard is the **state bird of Rajasthan**.
- **Habitat** – Dry grasslands and scrublands on the Indian subcontinent.
- Its largest populations are found in **Rajasthan** in the arid grasslands of Thar Desert National Park and Pokhran Field Firing Range.
- It is considered as an indicator of the health of grassland ecosystem.

The mascot for CMS COP13, which was held in Gandhinagar, India in 2020 was “Gibi - The Great Indian Bustard”.

- **Feed** – They are omnivores.
- **Reproduction** – They are a slow-reproducing species and lay few eggs and have almost a year-long parental care of chicks.
- **Threat** – Habitat loss, Hunting and poaching.
- **Conservation Efforts** – In 2012, **Project Bustard**, a national conservation program was launched to protect the GIB along with **Bengal florican** (Critically endangered) and **lesser florican** (Critically endangered).

Conservation Status of Great Indian Bustard		
IUCN Red List	Critically Endangered	
Wildlife (Protection) Act, 1972	Schedule I	
CMS Convention	Appendix I	
CITES	Appendix I	

- GIB has also been identified as one of the species for the recovery programme under the **Integrated Development of Wildlife Habitats** of Ministry of Environment, Forests and Climate Change.

9.28 Kashmir's Hangul (*Cervus hanglu hanglu*)

Despite conservation efforts, Kashmir's hangul deer risk is facing extinction.

- **About** - It is also known as the Kashmir stag or Kashmiri red stag which is highly shy and sensitive animal.
- It is the only Asiatic survivor or sub-species of the European red deer.
- **State animal** - It is the ***State animal of Jammu and Kashmir***.
- **Habitat** – It lives in dense riverine forests, high valleys and mountains of the Kashmir valley and northern Chamba in Himachal Pradesh.
- **Conservation Status**
 - IUCN - Critically endangered
 - CITES - Appendix I
- **Threats** - Habitat loss, poaching.
- **Distribution** –It is endemic to the hills of Kashmir and restricted to the ***Dachigam National Park***.



Other Important Topics

Melanochlamys droupadi

The Zoological Survey of India named a new marine species of head-shield ***sea slug*** after President of India Droupadi Murmu.

- This sea slug species belonging to ***Melanochlamys genus***.
- It was discovered from ***Digha of West Bengal coast and Udaipur of Odisha coast***.
- The new species of head-shield sea slug is found nowhere in the world.
- According to ZSI, species of this group are generally distributed in temperate regions of the Indo-Pacific Oceanic realm but 3 species are truly ***tropical distributed in*** Gulf of Thailand, West Bengal and Odisha coast.



Eenthu Pana (Cycas circinalis)

Eenthu Pana in Kerala is on the verge of extinction after being hit by an unknown and fast spreading plant disease.

- Eenthu Pana, *Cycas circinalis* or queen sago palm, is a palm-like tree that is native to the Indian subcontinent.
- It is commonly found in **Kerala**, especially in the Malabar region.
- The seeds of the Eenthu Pana are edible and are a rich source of protein and carbohydrates, have medicinal properties and a dietary supplement for diabetics.
- IUCN – **Critically endangered**.

Gray Whale (Eschrichtius robustus)

Grey Whale that vanished from the Atlantic Ocean was spotted again after more than 200 years.

- **Nickname** - “Devil fish”.
- Found mainly in shallow coastal waters in the ***North Pacific Ocean*** has recently been seen in New England.
- Usually ***lacks dorsal fin***, has mottled grey and white skin and a dorsal hump followed by pronounced ridges.
- Gray whales make one of the ***longest annual migrations*** of any mammal.
 - IUCN- Least Concern.
 - CITES- APPENDIX I.

Taeniogonalos deepaki

Entomologists of the Ashoka Trust for Research in Ecology and the Environment have discovered a new species of wasp in the Western Ghat region of Karnataka.

- The new species, *Taeniogonalos deepaki* is a **parasitoid wasp** in the family Trigonalidae.
- It is named after the medical doctor and nature enthusiast **Deepak Deshpande** who collected the specimen.
- **Parasitoids** are small insects that develop inside or on the outside of other insects, called hosts and they eventually kill their hosts.

Indopria Angulata

A new genus and species of parasitoid wasp has been discovered by a team of researchers at the Zoological Survey of India (ZSI), Kolkata.

- The species named **Indopria**, with 'Indo' representing India and 'pria' from Latin meaning 'little wasp', '**angulata**' (Latin) refers to the specialised characteristic of its wings.
- Its specialised wing morphology suggests an adaptation to aquatic habitats.



Miscophus Kaleshi

Zoological Survey of India discovers new species of Digger Wasp.

- The new digger wasp species named as *Miscophus Kaleshi* in honour of researcher and Doctor Kalesh S. in Thiruvananthapuram.
- It is one of the 2 new wasp species discovered in south India's habitats.



Donna Buang wingless stonefly

- *Riekoperla darlingtoni* is a species of stonefly endemic to Australia.
- Its suitable habitat is within the **Yarra Ranges National Park**.
- It is likely to be extremely sensitive to any amount of water pollution, sedimentation and any forms of habitat alteration.
- **IUCN** - Critically Endangered.



Wolf dogs

The Department of Animal Husbandry and Dairying recently issued a letter to states to not issue any licences or permit for sale and breeding of dogs it considers to be 'ferocious' and 'dangerous for human life'.

- Wolf dogs are produced by breeding a wolf with any of a variety of domestic dogs, including Akitas, German shepherds, Alaskan malamutes, and huskies.
- The term "wolf dog" is often used interchangeably with "wolf hybrid".
- People keeping wolf dogs will be punishable under the **Wild Life (Protection) Act, 1972**.



Pygmy Hippo (Choeropsis liberiensis)

A rare pygmy hippo was recently born in captivity in Athens' Attica Zoological Park, Greece.

- The pygmy hippo is the smaller, reclusive and nocturnal cousin to the more widely known common hippo.
- **Distribution** – Western Africa, mainly in Liberia, but also in Sierra Leone, Guinea, and Cote d'Ivoire.

- **Habitat** – They are solitary, living in lowland primary and secondary forests close to rivers, streams and palm tree swamps.
- **Conservation status**
 - IUCN – Endangered.
 - CITES - Appendix II.



Javan Tiger (*Panthera tigris sondaica*)

The Javan tiger, declared extinct in 2008, recently gave hope that a single hair found on the Java island in 2019 has been DNA-tested and is found to belong to the extinct species.

- **Distribution** – Javan Tiger is a now **extinct** subspecies of tiger endemic to the island of **Java in Indonesia**.
- It was one of the 3 Indonesian tiger subspecies, the Javan tiger, the Bali tiger, and the Sumatran tiger, all evolved from a single tiger ancestor called the **Sunda tiger**.
- **Distinction** – Javan tigers were smaller on average, closely related Bali tigers had long, thin stripes and a narrow face.
- **Habitat** – Tropical forests, evergreen forests, mangrove swamps, grasslands, mountains and savannahs.

Cotoneaster Cambricus

- Cotoneaster Cambricus, also known as **Great Orme Berry or Creigafaly Gogarth**.
- It is a deciduous shrub native to the **Great Orme peninsula in north Wales**.
- Only species of Cotoneaster native to the British Isles and has never been found naturally at any other location.
- IUCN - Critically Endangered.

10. SCIENCE AND TECHNOLOGY

SPACE

10.1 Kulasekarapattinam Spaceport

The Rohini Sounding Rocket was launched from the mobile launch pad to mark the commencement of physical work on the Kulasekarapattinam spaceport.

- **Geographical location** – Thoothukudi district of Tamil Nadu.
- It is **ISRO's 2nd satellite launch facility**, would be completed within 2 years to launch SSLVs in order.
- It would have the capacity **to launch 24 satellites per year**.
- **Need** – The rockets launched from ISRO's Sriharikota facility in Andhra Pradesh **1st heads east, and then turn south** to avoid the Sri Lanka's airspace, costing more fuel and reduce payload's capacity.
- **Geographical advantages** – It can head straight in the southern



direction without a dogleg manoeuvre and closer to equator than Sriharikota thereby reducing time and fuel wastage.

- **Economic significance**– It is relatively closer to the ISRO Propulsion Research Complex located in Mahendragiri, in Tirunelveli district, Tamil Nadu.
- It makes it easier to transport the rocket components safely in shorter time, thus reducing the costs involved.
- **Safety considerations** – Proximity to the eastern coastline of India are safer, as any failure of launches allow the debris to fall harmlessly in Bay of Bengal or Indian Ocean.
- **Promotes development** – A number of allied industries will come up in the neighbourhood that will create 1000s of jobs.

Quick Facts

- **Geo-stationary satellites** – They are usually communication satellites or satellites used for scientific research such as the International Space Station which are placed in the orbit that are parallel to equator.
- Launching these satellites from the sites near the equator towards the east direction will get an initial boost equal to the velocity of the Earth surface.
- **Polar satellites** – They are placed in polar orbits moving across the equator in north south direction and are generally launched in southward or northward direction.
- Therefore, they cannot take advantage of the Earth's rotation.
- **Small Satellite Launch Vehicles (SSLVs)** – They are designed to launch light-weight satellites less than 500 kg into the lower earth orbit at low costs.

10.2 MethaneSAT

Recently, MethaneSAT was launched aboard a SpaceX Falcon9 rocket from California, USA.

- **Aim** – To track and measure methane emissions at a global scale.
- **Promoting entity** – Environmental Defense Fund (EDF), a US-based non-profit environmental advocacy group.
- **Developing partners** – Harvard University, Smithsonian Astrophysical Observatory, New Zealand Space Agency
- **Mission partner** – Google
- **Features** – It is a satellite that will orbit the Earth 15 times a day, monitoring the oil and gas sector.
- High-resolution IR sensor and a spectrometer can track differences in concentrations as small as 3 parts per billion in the atmosphere.
- It also has a wide-camera view of about 200 km by 200 km.
- **Advantages** – Unlike previous satellites, it can pick up smaller emissions sources as well as larger emitters called 'super emitters'.
- It promotes transparency by making the data public for free in near real-time through Google's Earth Engine.
- It ensures accountability by allowing stakeholders and regulators to take action to reduce methane emissions.
- It will help the nations in global commitments to reduce methane emissions with real time tracking.
- **Limitations** – However, it does not necessarily mean that the data will compel polluters to curb their emissions and there's no guarantee that this information leads to a change in behaviour.

10.3 Chandrayaan-4

ISRO is gearing up for the next lunar mission 'Chandrayaan-4', to build on the accomplishments of Chandrayaan-3 mission (2023) while attempting more complex objectives.

- **Aim** – To land on the Moon and also return rocks and soils (lunar regolith) from the lunar surface to India.

- **5 spacecraft modules** – Like Chandrayaan-3 it takes lander, rover and the propulsion module along with 2 additional components to return the samples from the Moon.
- **Propulsion Module** – Similar to Chandrayaan-3, the propulsion module will guide Chandrayaan-4 in lunar orbit, before separating.
- **Descender Module** – It will make the lunar landing, similar to the Vikram lander on Chandrayaan-3.
- **Ascender Module** – Once the samples are collected and stored, the ascender module will eject from the lander and begin returning.
- **Transfer Module** – It will grab the ascender module and getting it out of lunar orbit and will journey back to Earth before the capsule with the rock and soil samples detach.
- **Re-entry Module** – This will be the capsule carrying the lunar regolith that will land on Earth.
- **2 separate launches** – It is the 1st mission involving 2 launch vehicles aimed at completing a single mission.
 - **LVM-3** – It will launch with 3 components (Propulsion Module, the Descender Module and the Ascender Module).
 - **Polar Satellite Launch Vehicle (PSLV)** – It will launch the Transfer Module and the Re-entry Module.

LVM-3 is India's heaviest launch vehicle.

If successful, Chandrayaan-4 will make India only the 4th nation to bring back samples from the lunar surface.

10.4 Project SOORYA

ISRO has formalised a project team, internally named 'SOORYA', to start building the New Generation Launch Vehicle (NGLV).

- **Aim** – To develop NGLV and thereby to build the country's own space station and send Indians to the Moon.
- **Requirement** – 3rd launch pad at Sriharikota will be necessary as NGLV's configuration will differ from the current class of rockets.
- **Features** – A 3-stage launch vehicle.
- **Fuel** – Green fuel combinations like methane-liquid oxygen or kerosene-liquid oxygen.
- **Payload capacity** – Up to 10 tonnes to Geostationary Transfer Orbit (GTO) that is more than twice the capability India's current heaviest rocket, the LVM-3, has.
- **Reusability** – Its parts are recoverable and can be reflown.
- **Cost-competitive rocket** – Reusability reduces the launch costs, of around \$1,900 per kg to Low Earth Orbit (LEO), compared to \$3,000/kg for an expendable configuration.
- **In line with India's Space Vision 2047** – It helps in achieving the goals of building a space station by 2035 and eventually sending Indians to Moon.
- **Private sector participation** – While ISRO will provide technical support, the private industry is expected to eventually handle building, operations and launches.

NGLV will be India's biggest rocket and is to be ready by 2034-35.

ISRO was created in 1969 by superseding Indian National Committee for Space Research (INCOSPAR). Its headquarters is in Bengaluru and works under the control of Department of Space (DOS).

10.5 Ghost Particles (Neutrinos)

Astronomers detect seven potential 'ghost particles' that passed through planet Earth.

- **Neutrinos** are **weakly interacting subatomic particles** that can travel astronomical distances undisturbed.
- They are a **type of electron** but, like neutrons, they do **not have any charge**.
- They are among the most abundant and tiniest particles in the universe.

Neutrinos belong to the family of particles known as leptons which consists of electrons, muons and tau particles.

- Neutrinos come from all kinds of different sources and have a **very small mass**.
- Neutrinos' weak charge and almost nonexistent mass have made them notoriously difficult for scientists to observe. They can only be "seen" when they interact with other particles.
- The rarity of interactions with other particles makes them almost impossible to track and hence they are **called ghost particles**.
- Currently, the largest neutrino-detecting telescope is the University of Madison-Wisconsin's "**IceCube**" telescope situated in the **Antarctic**.

Lepton (particle)	Anti-lepton (anti-particle)
e^- electron	e^+ positron
μ^- muon-minus	μ^+ muon-plus
τ^- tau-minus	τ^+ tau-plus
ν_e electron neutrino	$\bar{\nu}_e$ electron anti-neutrino
ν_μ muon neutrino	$\bar{\nu}_\mu$ muon anti-neutrino
ν_τ tau neutrino	$\bar{\nu}_\tau$ tau anti-neutrino

IceCube Neutrino Observatory

- It is the first detector of its kind, designed to observe the cosmos from deep within the South Pole ice in **Antarctica**.
- Approximately 300 physicists from 59 institutions in 14 countries make up the IceCube Collaboration.
- **The National Science Foundation (NSF)** provides the primary funding for the IceCube Neutrino Observatory, with assistance from partner funding agencies around the world.
- **The University of Wisconsin–Madison** is the lead institution, responsible for the maintenance and operations of the detector.
- They provide information to probe the most violent astrophysical sources - events like exploding stars, gamma-ray bursts, and cataclysmic phenomena involving black holes and neutron stars.
- IceCube has been using a string of golden globes, known as digital optical modules (DOMs), which are embedded in ice for detecting neutrinos which pass through the Earth.

10.6 Mars resonance on Earth

Mars causes the churning of Earth's ocean every 2.4 million years, which is linked to periods of increased solar energy and a warmer climate.

- **Astronomical Grand Cycles** – Deep-sea currents shifts every 2.4 million years, and this cycle is known as the astronomical grand cycles.
- This occurs due to the interaction between the orbits of Earth and Mars.
- **Resonance** – Mars and Earth are affecting each other through a phenomenon signified as resonance.
- Resonance is a concept wherein two bodies affect each other based on their gravitational push or pull on each other.
- This phenomenon is essential in keeping a balance in the solar system and ensuring the steady orbiting of the planets as every planet's orbiting affects its nearby one due to this resonance.
- **Eccentricity** – Resonance affects the shape of their orbits, called eccentricity (a measure of how close to circular their orbits are).
- Due to this resonance, the Earth is pulled slightly closer to the sun by Mars' gravitational pull.
- This means, our planet is exposed to more solar radiation and hence has a warmer climate, before drifting backward again, all over a period of 2.4 million years.
- **Deep Ocean Currents** – During warmer times, the deep-sea record shows more breaks, connected to stronger deep ocean currents.
- **Eddies** – The stronger currents, known as giant whirlpools or eddies, may reach the seafloor at the deepest parts of the ocean, known as the abyss or abyssal seafloor.

NASA's *Ingenuity* is the first helicopter to fly on Mars, helps in collecting samples from the surface from various locations on Mars.

Eddies, played a big role in warming seas in the past.

- Eddies don not move water like the AMOC, which shifts water between different latitudes.
- Contourites** – Once connected to the deep seafloor, these huge whirlpools could cause erosion and create large snowdrift-like buildups of sediments called “contourites”.
- AMOC** – Eddies may help the offsetting of ocean stagnation, which follows the slowing of [Atlantic meridional overturning circulation \(AMOC\)](#).
- AMOC** is a vast system of ocean currents that carries warm water from the tropics to the North Atlantic Ocean.
- It is responsible for driving the Gulf Stream and maintaining warm climates in Europe.

India's maiden interplanetary mission, Mangalyaan or the Mars Orbiter Missions (MOM), explores and observes Mars surface features, morphology, mineralogy and the Martian atmosphere.

10.7 PSLV Orbital Experimental Module 3 (POEM 3) Mission

ISRO's POEM 3 mission accomplishes zero orbital debris mission.

- The fourth stage of PSLV (PS4), also called the PSLV Orbital Experimental Module (POEM) will perform orbital experiments.
- Since this is the 3rd time ISRO has used PS4 to exhibit orbital experiments, XPoSAT's PS4 is called POEM-3.
- The spent PS4 stage will be used to conduct in-orbit scientific experiments in microgravity conditions for an extended duration of 4-6 months.
- It derives power from the solar panels mounted around the PS4 tank and a Lithium-ion battery.
- POEM-3 is equipped with 10 payloads.
- Following the successful placement of all satellites into their designated orbits, the final stage of the PSLV was converted into a 3-axis stabilized platform known as POEM-3.
- This stage was then deorbited from an altitude of 650 km to 350 km, enabling an expedited re-entry process.
- The mission objectives of these payloads were met in a month.

Payload	Purpose	Agency/Company
Radiation Shielding Experiment Module (RSEM)	Evaluation of Tantalum coating effectiveness	TakeMe2Space
Women Engineered Satellite (WESAT)	Comparison of Solar Irradiance and UV Index	LBS Institute of Technology for Women
BeliefSat0	Amateur radio satellite	K J Somaiya Institute of Technology
Green Impulse TrAnsmmitter (GIT)	Green bipropellant CubeSat propulsion unit	Inspecity Space Labs Private Limited
Launching Expeditions for Aspiring Technologies Technology Demonstrator (LEARTD)	Demonstration of subsystem of microsatellite	Dhruva Space Private Limited
RUDRA 0.3 HPGP	Green Monopropellant Thruster	Bellatrix Aerospace Private Limited
ARKA-200	Heater less Hollow Cathode for Hall thrusters	Bellatrix Aerospace Private Limited
Dust Experiment (DEX)	Interplanetary dust count measurement	PRL, ISRO
Fuel cell Power System (FCPS)	Demonstration of fuel cell	VSSC, ISRO
Si based High Energy cell	Demonstration of Silicon based High Energy cells	VSSC, ISRO

10.8 Euclid Satellite

Scientists are trying to de-ice Euclid satellite millions of kilometres away from Earth.

- Mission by** – The Euclid Telescope was launched by European Space Agency from Cape Canaveral in Florida.
- Objective** – The Euclid mission hopes to understand the evolution of the Universe by looking at the light emitted from galaxies 10 billion years ago.
- Euclid is a cosmology survey mission, optimized to determine the properties of dark energy and dark matter on universal scales.
- The telescope will also focus on gleaning more information on dark energy and dark matter and will scan more than 1/3rd of the sky.
- Named After** – It is named after the Greek mathematician Euclid of Alexandria, who lived around 300 BC and founded the subject of geometry.
- Features** – The Euclid spacecraft is approximately 7 m tall and 3.7 m in diameter.

Dark energy is the undetectable form of energy that is causing the expansion of space, about 68% of the universe is made of dark energy while dark matter makes up 27% and only 5% of the Universe is made of normal matter.

- **Components** – It consists of two major components: the service module and the payload module.
- **Orbit** – Its operational orbit will be a halo around a point known as the Sun-Earth Lagrange Point 2 (L2), at an average distance of 5 million km beyond Earth's orbit.
- **Lifetime** – Nominal mission lifetime is six years, with the possibility of extension (limited by the amount of cold gas used for propulsion).
- **Ice on the telescope** – The layers of ice covering Euclid's optics are the same width as a strand of DNA, but it is already impacting the spacecraft's vision.
- For most spacecraft, it would be enough to use in-built heaters to slightly raise the temperature of the entire spacecraft, which could clean the optics.
- But materials expand with heat, and they don't always return to the exact same state after cooling.
- To limit the possibility of such thermal changes affecting its sensitivity, the Euclid team will individually heating low-risk parts of the spacecraft gradually before they get the intended results.

Other Important Topics

PHANGS (Physics at High Angular resolution in Nearby GalaxieS) program

- The Physics at High Angular resolution in Nearby GalaxieS (PHANGS) program is a long-term project that uses telescopes to observe nearby galaxies.
- The program is supported by over **150 astronomers worldwide**.
- The program uses telescopes like
 1. Atacama Large Millimeter Array – (ALMA),
 2. Hubble Space Telescope, [James Webb Space Telescope](#), and
 3. Very Large Telescope (VLT) to make high-resolution observations.

Voyager 1

- [Voyager 1](#) is a NASA space probe launched in 1977 to study the **outer solar system** and interstellar space over a period of 5 years.
- It is the farthest (24 billion kilometres away) man-made object from Earth and the **1st spacecraft** to cross the heliosphere, the boundary between our solar system and interstellar space.
- Voyager 1 and Voyager 2 are the twin spacecrafts that made discoveries like the **intricacies of Saturn's rings** and the presence of active volcanoes on **Jupiter's moon Io**.

Kairos

Kairos, Japan's 1st privately built rocket, explodes after its launch from the Kii peninsula, Japan.

- Kairos is a **small, 3-stage solid-fuel** rocket.
- It is built by Japanese private company **Space One**.

Space-borne Assistant and Knowledge Hub for Crew Interaction (SAKHI)

- It is a multi-purpose app that will help astronauts on **Gaganyaan space flight mission** to carry out a range of tasks.
- **Developed by - Indian Space Research Organisation (ISRO)**.
- It monitors the health of the astronauts, help them stay connected with Earth and even alert them about their blood pressure, heart rate and oxygen saturation, dietary schedules.
- It will keep the crew connected with the onboard computer and ground-based stations, guaranteeing a seamless communication link.

Noctis Volcano

- It is a recently discovered **Volcano on Mars**, nestled between Noctis Labyrinthus and Valles Marineris.
- It is one of the largest structure in Mars size, bigger than the size of Mt.Everest.
- The discovery was made using data from a suite of missions including NASA's Mariner 9, Viking Orbiter 1 and 2, Mars Global Surveyor, Mars Odyssey, and [Mars Reconnaissance Orbiter](#).

Statio Shiv Shakti

- The **International Astronomical Union (IAU)** working group for Planetary System Nomenclature has approved the name 'Statio Shiv Shakti' for the landing site of Chandrayaan-3's Vikram lander recently.
- Planetary nomenclature is used to identify a feature on the surface of a planet or satellite so that it can be easily located, described, and discussed.
- **IAU** - The IAU is the **internationally recognised authority** for assigning names to planetary surface features.
- **Founded in** – 1919; **Headquarters** - France.
- **India's status** – India is a **member** to the International Astronomical Union since 1964.

Space science and Technology Awareness Training (START) 2024 programme

The Indian Space Research Organisation (ISRO) will soon conduct the START 2024 programme.

- **Aim-** To attract the youngsters to the fields of space science and technology.
- **Hosted in** - Educational institutes, universities, colleges **within India** who are offering UG and PG courses in physical sciences and technology.
- **Domains** - The programme will cover various domains of space science, including Astronomy & Astrophysics, Heliophysics & Sun-Earth interaction, Instrumentation, and Aeronomy.

T Coronae Borealis (tau Coronae Borealis)

T Coronae Borealis, or T CrB, last exploded in 1946 and astronomers believe it will do so again between February and September 2024.

- T Coronae Borealis is a binary star system comprised of a cool red giant and a hot white dwarf star 3,000 light years away in the constellation **Corona Borealis**.
- The smaller white dwarf has been stealing matter from the red giant and appears to be getting ready to emit a burst of energy, making it visible for at least a few days.
- It is known as a recurring nova where matter, mostly hydrogen, is collected by the white dwarf until enough mass is reached, creating a fusion reaction.
- That will then emit a burst of energy, which includes visible light.

Chandra X-ray Observatory

- The Chandra X-ray Observatory is a **NASA space telescope** that collects X-rays from distant environments to help scientists understand the universe's structure and evolution.
- It was launched on **1999**, aboard the Space Shuttle Columbia from the Cape Canaveral Air Force Station with a mission duration of **24 years**.
- The Chandra X-ray Observatory is part of NASA's **"Great Observatories"** along with the
 1. Hubble Space Telescope
 2. The Spitzer Space Telescope
 3. The Compton Gamma Ray Observatory

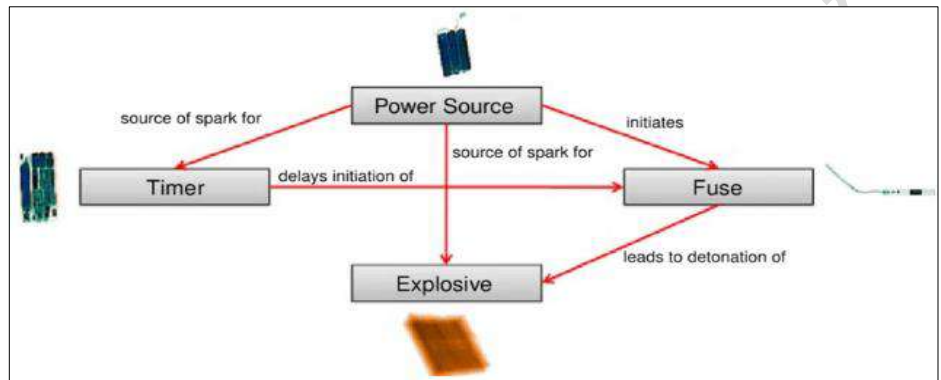
DEFENCE

10.9 Improvised Explosive Devices (IED)

The recent explosion in Bengaluru's Rameshwaram Cafe was prima facie caused by an improvised explosive device (IED).

- The term "IED" 1st entered common usage was during the United States' Iraq invasion (beginning in 2003), where such bombs were commonly used against US forces.

- IED** – It is basically a *home-made bomb* which may range from a *small pipe bomb to a sophisticated device* capable of causing massive damage and loss of life.



- Smaller bombs are easier to hide, carry, deploy and are also generally much less damaging than larger ones.

- Deployment** – Using a vehicle, carried, placed, or thrown by a person, delivered in a package, or concealed on the roadside.

- Components**

- **An initiator** – A trigger to set the explosion off.
- **A switch** – It arms the explosive.
- **A main charge** – It causes the explosion.
- **A power source** – Mostly, an electric initiator that require an electronic power source.
- **A container** – An enclosure of all other components.

The colloquial name of an IED packed with depleted Uranium is **dirty bomb**.

- Enhancements** – *Nails, glass, or metal fragments* to increase the amount of shrapnel released and thus the damage it causes.

- It may also include hazardous *toxic chemicals, or radio-active* substances.

- Materials used** – It include *fertilisers such as ammonium nitrate and urea nitrate*, gunpowder, and hydrogen peroxide.

- Damages** – The extent of damage depends on its size, construction and placement.

Notable instances of **IEDs usage in India** include the 1993 Mumbai serial blasts, the 2008 Jaipur blasts, the 2006 Jama Masjid bombings, and the 2013 Bodh Gaya bombings. It have also been commonly used by Maoist insurgents, and Kashmiri militants.

10.10 INS Jatayu

The existing Naval Detachment Minicoy was upgraded to a naval base and commissioned as INS Jatayu.

- INS Jatayu Naval Base** – It will have additional infrastructure such as an *airfield, housing, and personnel*.

- It will effectively be the country's *2nd naval base in Lakshadweep*.

- Objective** – To incrementally augment security infrastructure at the strategic Lakshadweep Islands.

- Significance** – Facilitate anti-piracy and anti-narcotics operations in the western Arabian Sea.

- Augment India's capability as the 1st responder in the region.

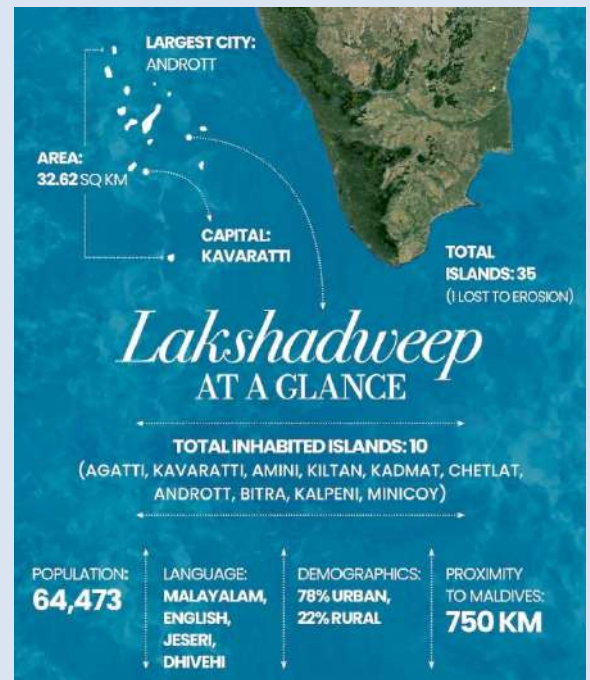
- Counter the growing Chinese influence in the Indian Ocean Region.

- Challenges** – The fragile ecology of the island may pose challenges for the construction of a jetty (an extension from land out into water).

Indian Navy's 1st base on Minicoy is **INS Dweep** in Kavaratti, was commissioned in 2012.

The Lakshadweep Islands & its Importance

- **Name** – Lakshadweep means '*a hundred thousand islands*' in Sanskrit and Malayalam.
- **An archipelago** – It consists of *36 islands* located between 220 km and 440 km from Kochi.
- The islands, *only 11 of which are inhabited*, have a total area of only 32 sq km.
- **Chain of coralline islands in the Indian Ocean** – It includes Lakshadweep along with Maldives to the south, and the Chagos archipelago farther beyond, to the south of the equator.
- **Significance** – Given their location in the Indian Ocean, the Lakshadweep are of huge strategic importance to India.
- **Minicoy** - It is the *southernmost atoll of the Lakshadweep* archipelago.
- It straddles *vital Sea Lines of Communications (SLOCs)*, the world's main maritime highways including the *8 Degree Channel* (between Minicoy and Maldives) and the *9 Degree Channel* (between Minicoy and the main cluster of Lakshadweep islands).
- **Concerns** – These Islands are also *vulnerable to marine pollution*.



10.11 MILAN 2024

The 12th edition of Milan exercise held recently in Visakhapatnam, the city of Destiny in 2024.

MILAN

- **Originated in** – 1995, was originally conceived in line with India's '*Look East Policy*'.
- **Host** – India
- **Duration** – Biennial
- **Type** – Multi-national naval exercise
- **Founding Members** – India along with Indonesia, Singapore, Sri Lanka and Thailand.
- **Aim** – To enhance cooperation and interoperability among the navies of diverse participating countries.
- **Exercise** – It includes professional exercises, seminars, social events and sporting fixtures.
- **Aim** – To enhance professional interaction between friendly navies and gain experience in multilateral large force operations at sea.
- **Theme** – '*Camaraderie, Cohesion, and Collaboration*'.
- **The Harbour Phase** – It will have *Table Top Exercise*, Interactions of Young Officers, Outstation Cultural visits and *International City Parade*.
- **The Sea Phase** – Indian Navy ships, aircraft and submarines *led by Indigenous aircraft carrier INS Vikrant* and 20-25 Foreign Naval Units will participate.
- It includes advanced air defence operations, Anti-Submarine warfare, Anti Surface warfare operation and War at Sea.
- **Significance** – An opportunity to share operational insights in harbour, hone skills at sea, enhance camaraderie on the sports fields, and gain an exposure to Indian culture.

Malacca Strait links the Andaman Sea of the Eastern Indian Ocean to the South China Sea and serves as a transit for over 40% of global commodities.

The Philippines and Indonesia are the largest and 3rd largest suppliers of seafarers, respectively.

- **Strengthens Southeast Asian countries** – Security of vital sea lines of communication (SLOCs) in the Indian Ocean is important for energy and trade interests.
- It helps to *expand their naval engagements* beyond their traditional geographical neighbourhood.
 - Singapore, Indonesia, and Thailand since 1995, Malaysia in 1997, Myanmar in 2003, and Brunei, Cambodia, the Philippines, and Vietnam in 2012.

10.12 Trisonic Wind Tunnel (TWT)

Recently, 3 major space infrastructure projects of ISRO was inaugurated which includes a Trisonic Wind Tunnel at Vikram Sarabhai Space Centre (VSSC) at Thumba in Kerala.

- **TWT** – A unique *wind tunnel capable of simulating 3 distinct flight* regimes, so the name trisonic
 - **Subsonic** – Below the speed of sound
 - **Transonic** – At the speed of sound
 - **Hypersonic** – Above the speed of sound
- **Aim** – To *test the aerodynamic performance* of scaled-down models of rocket and re-entry spacecrafts under various atmospheric conditions.
- **Features** – It is a **1.2 metre TWT**, a state-of-the-art facility and the first of its kind in India.
- It is **160 metres in length** with a diameter of 5.4 metres.
- It can simulate flight conditions from 0.2 times the speed of sound (68 m/s) to **4 times the speed of sound** (1360 m/s).
- It also contains different sections for different velocity regimen of wind.
- It produces *controlled uniform airflow* to evaluate aerodynamic characteristics and designs by evaluating forces, moments, load distribution, unsteady pressures, acoustic levels etc.
- **Improves design and efficiency** – It helps in optimizing the design of rockets and spacecraft, leading to *enhanced performance and fuel efficiency*.
- **Reduce Development costs** – It provides a *cost-effective alternative* to expensive, real-world flight testing, allowing ISRO to iterate and refine designs more efficiently.
- **Position India at the forefront** – India is also *one of only 3 countries* to have a wind tunnel that can produce hypersonic speeds after the US and France.
- **Atmanirbhar Bharat** – *Fully conceived by ISRO and executed through Tata Projects* and is a classic example of Make in India.
- It will provide *self-reliance for the end-to-end design* of various upcoming launch projects.

The TWT at VSSC is India's 3rd hypersonic wind tunnel (HWT) after the DRDO's Hypersonic Wind Tunnel at the APJ Abdul Kalam Missile Complex in Hyderabad, and the 1.2 metre TWT at National Aerospace Laboratories in Bengaluru.

10.13 Mission Divyastra

India successfully tests Agni-5 missile with MIRV technology, named 'Mission Divyastra' from Dr APJ Abdul Kalam Island in Odisha.

- **Agni missiles** are the main land-based delivery systems for India's nuclear weapons.
- **Agni-5**, a long range (6000km) ballistic missile, uses a 3-stage solid fuelled engine. All the Agni series missiles inducted can now carry only a single warhead.
- **Trial conducted by** – DRDO
- **Mission** – It is the *1st flight test* of indigenously developed Agni-5 missile with Multiple Independently Targetable Re-entry Vehicle (MIRV) technology.
- The system is also equipped with indigenous avionics systems and *high accuracy sensor* packages along with MIRV technology.

- **MIRV** – A single missile carrying several nuclear warheads, each to be released at **different speeds with different trajectories to hit different targets** hundreds of kilometers apart.

MIRV Missiles		
Land variant	Submarine variant	Both land and submarine variant
China	USA, the UK and France	Russia

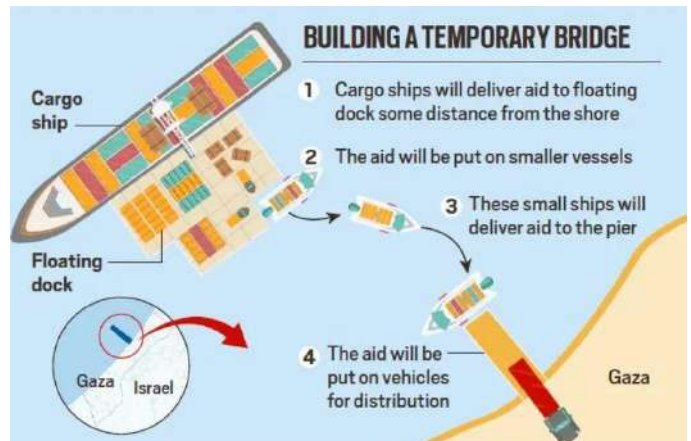
- **Number of warheads** – It depends on its design, weight, size, range and other parameters.
- India's Agni-5 test flight can carry 3 to 4 warheads, while there are other systems that can carry as many as 15 warheads, or even more.
- **Challenges** - Development requires the combination of large missiles, small warheads, accurate guidance, and a complex mechanism for releasing warheads sequentially during flight.
- **Advantages of MIRV** – One missile can inflict multiple damages thus also *cost effective*.
- It also has the *ability to penetrate missile defence systems* and can be made to carry *decoy warheads to confuse* the defence system.
- **Significance** – A significant boost to credible strategic *deterrence against China* and also strengthens India's claim for a place in future arms control negotiations.
- The *project director was a woman* and there were significant contributions from other women scientists.
- **India's Nuclear Triad**
 - **Land vector** – Prithivi-II, Agni-1, Agni-2, Agni-3, Agni-5.
 - **Air Vector** – Sukhoi-30MKI, Mirage-2000, Jaguar & Rafale fighter jets.
 - **Sea vector** – Only INS Arihant, nuclear powered ballistic missile submarine (SSBN).

MIRV was developed in the Cold War with US testing it at first in 1970s. At present, USA, Russia, UK, and France have MIRV missiles. Pakistan is also developing such missiles.

10.14 Joint Logistics Over-the-Shore (JLOTS)

US Army ships have sailed from Virginia with equipment to build a floating pier on the Gaza coast to deliver humanitarian aid to the enclave.

- **JLOTS** – It is the project to build the floating pier on the [Gaza](#) coast.
- Pier is a large wooden or metal structure that is built out into the sea from the land.
- Boats can stop at piers so that people or goods can be taken on or off.
- JLOTS is the American solution to deal with hunger and an impending famine in Gaza.
- JLOTS capabilities are used to transport cargo by sea when one or more ports cannot be operated or are not available for loading or unloading.
- Usually, JLOTS is part of a military campaign or exercise, such operations usually involve joint operations by the forces.
- The navy transports the goods and provides protection, the army or other agencies are involved in building the last mile bridge, delivery, etc.
- The floating pier in Gaza will be built with no US boots on the ground.
- The US will take the help of the private company Fogbow, which is run by former military and intelligence officials.



- **The Floating Dock** – The floating dock will be a platform built with pieces of steel, which will be delivered to the spot by a roll on, roll off ship, which is essentially a cargo ship with a platform to load and unload heavy cargo.
- While the pier will be attached to the shore, the dock could be located up to a kilometre from the coast.
- The dock is required so that ships carrying aid don't have to come close to the shore where they may possibly get stuck in shallow water.

All floating bridges can take heavy weights such as tanks and cargo, and they stay afloat because of buoyancy and density.

10.15 Signals Technology Evaluation and Adaptation Group (STEAG)

Army raises elite unit to work on critical technologies having military applications.

- STEAG will undertake research and evaluation of futuristic communication technologies like 6G, Artificial Intelligence (AI), Machine Learning (ML) and quantum computing for military use.
- STEAG will be headed by a Colonel rank officer.
- STEAG is mandated to nurture technologies spanning the complete spectrum of wired and wireless systems.
- It will carry out technical scouting, evaluation, development, management of core ICT solutions, and provide user interface support by maintenance and upgradation of contemporary technologies available in the environment.
- The setting up of STEAG is part of the Army's efforts to develop technologies considering the future battlefield.
- STEAG will help bridge the divide between the armed forces on the one hand and industry and academia on the other.
- STEAG is aligned with the tenets of Atmanirbhar Bharat and Start-Up India.

10.16 Armed Forces (Special Powers) Act (AFSPA)

AFSPA extended in parts of Arunachal, Nagaland for six more months.

Disturbed Area

- A disturbed area is one which is declared by notification under Section 3 of the AFSPA.
- An area can be disturbed due to differences or disputes between members of different religious, racial, language or regional groups or castes or communities.
- The Central Government, or the Governor of the State or administrator of the Union Territory can declare the whole or part of the State or Union Territory as a disturbed area.
- A suitable notification would have to be made in the Official Gazette.
- As per Section 3, it can be invoked in places where the use of armed forces in aid of the civil power is necessary.

- **Unbridled Power** – AFSPA gives armed forces and the Central Armed Police Forces (CAPF) the power to maintain public order in “disturbed areas”.
- Armed forces have the authority to prohibit a gathering of five or more persons in an area, can use force or even open fire after giving due warning if they feel a person is in contravention of the law.
- If reasonable suspicion exists, the army can also arrest a person without a warrant; enter or search a premises without a warrant; kill anyone acting against the law and ban the possession of firearms.
- Any person arrested or taken into custody may be handed over to the officer in charge of the nearest police station along with a report detailing the circumstances that led to the arrest.
- **Origin** – The Act came into force in the context of increasing violence in the Northeastern States decades ago, which the State governments found difficult to control.

The Armed Forces (Special Powers) Act (AFSPA), 1958, was completely withdrawn in Meghalaya in 2018, Tripura in 2015 and Mizoram in the 1980s.

- The Armed Forces (Special Powers) Bill was passed by both the Houses of Parliament and it was approved by the President on September 11, 1958.
- It became known as the Armed Forces Special Powers Act, 1958.
- **States under AFSPA** – Nagaland, Manipur, Assam, Arunachal Pradesh, and Jammu & Kashmir.
- **Issued by** – Both the State and Central governments can issue notification regarding the AFSPA.
- The MHA issues periodic “disturbed area” notification to extend the AFSPA only for Nagaland and Arunachal Pradesh.
- The notification for Manipur and Assam is issued by the State governments.

10.17 Pushpak

Pushpak, an SUV-sized winged rocket released from an Indian Airforce Chinook helicopter successfully landed through RLV LEX-02 experiment recently.

- Pushpak is a Reusable Launch Vehicle (RLV).
- **Developed by** - Indian Space Research Organisation (ISRO).
- This is ISRO’s 2nd series of RLV landing experiment.

RLV-LEX -01 Experiment is the first test with RLV-TD (HEX1) involved the vehicle landing on a runway over the Bay of Bengal.

RLV-LEX-02 Experiment

- It demonstrated the autonomous landing capability of RLV from off-nominal initial conditions at release from a helicopter.
- Pushpak, was lifted by an Indian Airforce Chinook helicopter and was released from 4.5 km altitude.
- After release at a distance of 4 km from the runway, Pushpak autonomously approached the runway along with cross-range corrections.
- It landed precisely on the runway and came to a halt using its brake parachute, landing gear brakes and nose wheel steering system.

Other Important Topics

PROJECT SEABIRD

- The Project Seabird is a naval infrastructure project that involves a **naval base in Karwar, Karnataka.**
- The project was originally conceived by **Admiral OS Dawson,** the Chief of Naval Staff in the early 1980s.
- The 1st phase of this project was commissioned in 2005 and the 2nd phase is yet to be completed.
- Once completed, it will be the largest naval base in the Asia.

Carl Gustaf Weapon System

- SAAB will be the 1st foreign fully-owned defence production facility in India.
- The Carl-Gustaf is a multi-purpose, man-portable, recoilless weapon system.
- The Carl-Gustaf has a range of ammunition with varying ranges, with a maximum range of **upto 1500m.** The anti-tank ammunition has a range of **500m.**

Exercise Samudra Laksamana

- It is a **bilateral maritime exercise** between the **India and Malaysia.**
- The exercise aims to strengthen bonds and enhance interoperability between the Indian and Royal Malaysian Navy.

Sea Defenders-2024

- Sea Defenders, 2024 is a bilateral cooperation between the Indian Coast Guard (ICG) and the United States Coast Guard (USCG).

Exercise Bharat Shakti

- It is a **Tri-Services Live Fire and Manoeuvre Exercise**, first-of-its kind initiative held in Pokhran, Rajasthan.
- The exercise aligns with the Atmanirbhar Bharat initiative, showcasing India's capabilities in multi-domain operations.

Exercise Tiger Triumph

- It is a **bilateral tri-service** Humanitarian Assistance and Disaster Relief (HADR) exercise between **India and the U.S.**
- Aim** – To develop interoperability for conducting HADR operations and refine Standard Operating Procedures (SOPs) to enable rapid and smooth coordination between both countries.

EXERCISE IMT TRILAT- 2024

- It is a joint Tri Lateral maritime exercise between **India, Mozambique, and Tanzania.**
- The exercise aims at capability development to address common threats through training and sharing of best practices.

Advanced Medium Combat Aircraft (AMCA)

- The Advanced Medium Combat Aircraft (AMCA) is a 5th generation stealth fighter jet capable of achieving supersonic cruise speeds.
- It is being developed by India for the Indian Air Force and Navy.
- The AMCA is a single-seat, twin-engine aircraft with a **maximum speed of around 2,600 kmph (Mach 2.15) and a combat range of 1,620 km.**
- The AMCA will provide a low radar cross-section and have an internal payload of 1,500 kg and an external payload of 5,500 kg with 6,500 kg of internal fuel.
- In India, the AMCA will follow the progressive induction of the Tejas Mark-1A and Mark-2 jets.

INSAT-3DS

Satellite	Salient features
Mission	Meteorological services, Data relay and Satellite Aided Search & Rescue services.
Payloads	6-channel Imager and a 19-channel Sounder.
Orbit	Geostationary orbit
Launch Vehicle	GSLV

- INSAT-3DS is a **meteorological satellite** launched by the Indian Space Research Organisation (ISRO).

- The mission is fully funded by the **Ministry of Earth Sciences (MoES)**.
- It is designed for enhanced meteorological observations and monitoring of land and ocean surfaces for weather forecasting and disaster warning.
- The satellite will augment the Meteorological services along with the presently operational INSAT-3D and INSAT-3DR satellites.

Vajra Sentinel System

- The Vajra Sentinel System is an **anti-drone system** that can detect, track, and neutralize drones at **extraordinary ranges**.
- It is designed by **Big Bang Boom Solutions Private Limited (BBBS)**, Chennai based defense startup.
- This is the largest contract signed by the MoD under the Innovations for Defence Excellence (iDEX) initiative.
- The system's core sensor, built around Artificial Intelligence and computer vision algorithms, enables precise identification, classification and location identification of drones.
- It utilises **passive RF sensor technology** to eliminate false alarms, and its sensor and jammer combination meets stringent military standard specifications for durability and reliability.
- It has a number of state-of-the-art tech improvements such as Advanced Electronically Scanned Array (AESA) radar and kamikaze drones which can be upgraded on demand by the user.
- The system's core sensor, built around Artificial Intelligence and computer vision algorithms, enables precise identification, classification and location identification of drones.

Spotter drone

- The Spotter drone is a cutting-edge unmanned aerial vehicle (UAV) indigenous multi-copter drone developed by **Sagar Defence** for the Indian Navy.
- The drone can operate without issue in rough sea environments and high crosswinds.
- The Spotter drone also allows the Indian Navy to schedule inspections to detect threats and share information in real time to immobilize them.

HEALTH

10.18 Zombie Deer Disease

Zombie deer disease is spreading and rising in USA and scientists are concerned that it could jump to humans.

- It is a **contagious degenerative disease**, also known as **chronic wasting disease (CWD)**.
- **Caused by** – *A prion (Prions are misfolded proteins that can cause normal proteins in the brain to misfold as well, leading to neurological degeneration.)*
- As the degeneration continues, the afflicted animal's brain cells die, ultimately resulting in its death.
- **Vulnerable species** – deer, elk, reindeer, sika deer, and moose.
- **Spread** – So far in Canada, the US, Norway, Sweden and South Korea.
- **Transmission** – They are reportedly spread via bodily fluids like saliva, urine, blood, or feces.
- **Symptoms** – It is characterised by myriad symptoms, such as drooling, lethargy, stumbling and a vacant gaze.
- It **progressively deteriorates the brains** of these animals, leading to dementia-like symptoms and eventual death.
- **Diagnosis** – It can only be confirmed by testing brain or lymph node samples from dead animals.
- There is **no reliable test for live animals** yet.

The 1st case of chronic wasting disease (CWD) was discovered in Colorado in 1967.

- **Prevention** – By *reducing the contact and transmission* of prions among cervids and their environment.
- **Treatment** – There are *no treatments or vaccines* available.
- **Challenges** – Prions can *persist in the environment* for extended periods and are resisting traditional disinfection methods such as formaldehyde, radiation and incineration at extreme temperatures.
- **In Humans** – While there is *no conclusive evidence that CWD can directly infect humans*, the possibility remains a point of concern.

Quick Facts

- Prion diseases, such as Creutzfeldt-Jakob disease (CJD) in humans and “mad cow disease” in cattle, have shown that they can cross the species barrier with devastating consequences.
- The outbreak of mad cow disease in Britain, for instance, resulted in the slaughter of millions of cattle and led to 178 human deaths attributed to the human variant of the disease since 1995.

10.19 National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE)

India recently launched the ‘National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE)’ along with a booklet on Snakebite and a Poster on “Dos” and “Don’ts”.

- It is a broad framework for management, prevention and control of Snake bite envenoming in India.
- **Launched by** – Ministry of Health and Family Welfare.
- Aims to halve the number of death & disability due to snakebite envenoming by 2030 through ‘One Health’ approach
- **Mission** – To progressively *reduce the morbidity, mortality* and its associated complications in humans due to Snake bite.
- **Components** – Human, wildlife, tribal and animal health component.
- **Human-health Component** – Surveillance of snake bite case, emergency care services, anti-snake venom at all health facilities, and institutionalization of Regional Venom Centre.
- Human health component are already being implemented under snakebite prevention and control through the State and District Nodal Officer (SNO & DNO) under National Health Mission.
- **Wildlife-health component** – Public awareness, research & monitoring, snake venom collection, antivenom distribution and snake relocation.
- **Animal & agriculture component** – Prevention of snake bites in livestock, community engagement etc.
- **Joint monitoring** – Component wise monitoring and independent external evaluation of the state action plan.
- **Key stakeholders** – As a nodal agency, they directly involve in providing technical and logistic support to the State/District and below level and also help in formalizing the State Action Plan.
- **A guidance document** – For the states / UTs and stakeholders to develop their own action plan, specific to their needs.
- The states will identify and nominate State and District Nodal Officer (SNO & DNO).
- **A helpline number ‘15400’** – For immediate assistance & guidance to individuals and communities affected by snakebites.
- It will be *piloted in 5 states and Union Territories* (UTs) - Puducherry, Madhya Pradesh, Assam, Andhra Pradesh and Delhi.

Snakebite Envenoming

- A potentially life-threatening disease following the bite of a venomous snake.
- Snake bites can cause paralysis, bleeding disorders, kidney failure and local tissue destruction, etc.
- **WHO** – It formally lists the snakebite envenoming as a highest priority Neglected Tropical Disease in 2017.
- **India** – It accounts for 50% of all snakebite deaths globally.
- Known as the *Snakebite capital of the world*.
- Around 90% of snakebites in India are caused by the ‘Big 4 Crawlers’
 - Common Krait
 - Indian Cobra
 - Russell's Viper and
 - Saw Scaled Viper

10.20 Hemoglobin A1C (HbA1C) Test

India is estimated to have 10.13 crore people with diabetes, and another 13.6 crore people who are pre-diabetic.

Diabetes mellitus

- A chronic metabolic disorder & the most common pancreatic endocrine disorder (Non-Communicable Disease).
- Characteristics** - Caused due to insufficient, deficient or failure of *insulin secretion*.
 - Hyperglycaemia** - Increase in blood sugar level
 - Glycosuria** - Excretion of excess glucose in the urine
 - Polyuria** - Frequent urination
 - Polydipsia** - Increased thirst
 - Polyphagia** - Increase in appetite
- Types of Diabetes** - There are 3 main types of diabetes.
 - Type 1 diabetes** is thought to be caused by an autoimmune reaction that stops your body from making insulin.
 - Type 2 diabetes** is caused when your body does not use insulin well and can't keep blood sugar at normal levels.
 - Gestational diabetes** is caused by the insulin-blocking hormones that are produced during pregnancy

Factors	Type-1 (Insulin dependent diabetes)	Type-2 (Non-insulin dependent diabetes)
Prevalence	10-20%	80-90%
Age of onset	Juvenile onset (Less than 20 years)	Maturity onset (Greater than 30 years)
Body weight	Normal or underweight	Obese
Defect	Insulin deficiency due to destruction of β -cells	Target cells do respond to insulin
Treatment	Insulin administration is necessary	Can be controlled by diet, exercise and medicine.

- HbA1C Test** - One of the most commonly-used tests to diagnose [pre-diabetes](#) and [diabetes](#) (both type 1 and type 2).
- Also known as glycated haemoglobin or glycosylated haemoglobin test.
- Working** – Sugar which enters the blood stream from the food consumed attaches to the hemoglobin in the red blood cells (RBCs).
- The HbA1C test measures the percentage of RBCs that have sugar-coated, or glycated, haemoglobin.
- An HbA1C below 5.7% (normal); between 5.7 and 6.4% (pre-diabetic); and 6.5% or higher (diabetic).
- The test's results may change under certain conditions, including kidney or liver failure, severe anaemia or a blood disorder such as thalassemia, for early or late pregnancy, etc.

Haemoglobin is a protein that transports oxygen to all the cells of the body.

India accounts for 17% of all diabetes patients in the world.

Traditional Testing	HbA1C
<ul style="list-style-type: none"> Fasting, post-prandial or post-meal blood sugar tests give blood sugar levels within a specific time frame. The traditional blood sugar tests may fluctuate depending on items in the person's latest meal and when they last consumed it. 	<ul style="list-style-type: none"> The HbA1C test reflects average blood glucose levels over the last 2 to 3 months. The HbA1C test is independent of these variables, making it more reliable and can be taken irrespective of when the latest meal was consumed.

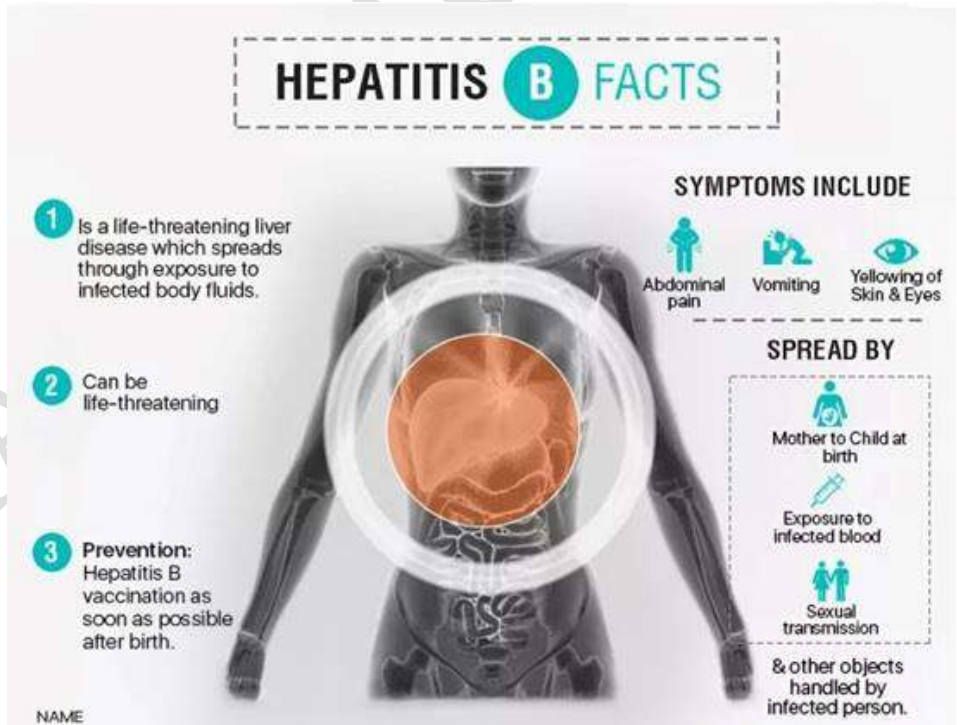
10.21 Hepatitis B

Millions of people living with chronic hepatitis B are unaware they have the virus.

- **Hepatitis –** It means ***inflammation of the liver.***
- Heavy alcohol use, toxins, some medications, and certain medical conditions can cause hepatitis.
- **Types of hepatitis**
 - **Viral hepatitis -** Hepatitis A , B, C, D and E
 - **Non-viral hepatitis -** Autoimmune hepatitis, alcoholic hepatitis, and drug-induced hepatitis.

Hepatitis	A	B	C	D	E
Transmission	-Fecal-Oral -Contaminated Food/Water	-Blood to blood -Sex	-Blood to blood -Sex (less common)	-Blood to blood -Sex -Only occurs when HBV is present	-Fecal-Oral -Contaminated Food/Water
Chronic Infection	No	Yes	Yes	Yes	Genotype 3 only
Prevention	-Pre-exposure vaccine	-Pre-exposure vaccine	-Screening donor blood -Harm reduction	-Pre-exposure vaccine	-Ensure safe drinking water, -Avoid undercooked pork & shellfish
Treatment	-Management of symptoms	-Treatment for management of chronic infection	-Treatment/cure for chronic infection	-No approved treatments	-Management of symptoms

- **Hepatitis B –** Caused by the ***hepatitis B virus.***
- **Types -** The infection can be ***acute*** (short and severe) or ***chronic*** (long term).
- **Transmission –** Through contact with infected body fluids like blood, saliva, vaginal fluids and semen.
- From mother to child during birth, body fluids during sex with an infected partner, unsafe injections or exposures to sharp instruments.
- **Symptoms -** Yellowing of the skin and eyes (jaundice), dark urine, feeling very tired, nausea & vomiting, pain in the abdomen, etc.
- **Prevention -** There are ***vaccines to prevent hepatitis A and hepatitis B*** but there is ***no vaccine available for hepatitis C.***
- **Treatment -** There is no specific treatment for acute hepatitis B. Chronic hepatitis B infection can be treated with oral medicines, including tenofovir or entecavir.



Hepatitis D, also known as “delta hepatitis,” only occurs in people who are also infected with the hepatitis B virus.

10.22 Vitamin D

An 89 year old resident in the UK died as due to overdose of vitamin D.

- Vitamin D also referred as calciferol is a fat-soluble vitamin.
- **Sources –** Sunlight exposure triggers vitamin D synthesis in the skin, making it the primary natural source.

- Foods rich in vitamin D, including fatty fish like salmon, tuna, and mackerel, as well as fortified dairy products like milk, yogurt, and cheese.
- Eggs, mushrooms exposed to sunlight, and fortified plant-based milk alternatives are also sources.
- **Role of Vitamin D** – Crucial role in maintaining overall health by regulating calcium and phosphorus absorption, supporting bone health, and modulating immune function.
- It helps promote strong bones and teeth, reduces the risk of osteoporosis, and supports muscle function.
- Vitamin D is believed to have anti-inflammatory properties and may contribute to reducing the risk of certain chronic diseases, including cardiovascular disease, autoimmune disorders, and some cancers.

Blood tests can measure serum levels of 25-hydroxyvitamin D (the primary circulating form of vitamin D) and calcium to assess for toxicity. Imaging studies such as X-rays or bone density scans can also be used to evaluate bone health and assess for signs of hypercalcemia.

- **Vitamin D Toxicity** – When one consumes too much of these supplements, it might lead to vitamin D toxicity or hypervitaminosis.
- Hypercalcemia or high amounts of calcium, is a direct consequence of high level of Vitamin D in the body.
- Symptoms of hypercalcemia may include confusion, disorientation, excessive thirst, frequent urination, and kidney damage.
- **Symptoms** – In its early stages, symptoms may include nausea, vomiting, poor appetite, constipation, weakness, and weight loss.
- **Treatment** – Treatment of vitamin D toxicity primarily involves stopping vitamin D supplementation and limiting dietary sources of vitamin D.
- In severe cases of hypercalcemia, medical interventions such as intravenous fluids, diuretics, or medications to lower calcium levels may be necessary.
- **Ideal amount** – The ideal amount of vitamin D in a human body should be 10 micrograms per day.
- For most adults, the recommended dietary allowance (RDA) for vitamin D ranges from 600 to 800 IU per day, with an upper limit of 4,000 IU per day to avoid toxicity.

Other Important Topics

Alaskapox

The first known fatality from the recently discovered Alaska pox virus has been reported in Alaska.

- Alaskapox belongs to a family of brick-shaped viruses that can infect animals and humans.
- These bugs, known as orthopoxviruses, tend to cause lesions, or pox, on the skin.
- Smallpox is perhaps the most famous of the lot, but other family members include camelpox, cowpox, horsepox and mpox – formerly known as monkeypox.
- Alaskapox virus has been confirmed in 2 specific species previously - red-backed voles and shrews.
- Human-to-human transmission of AKPV has **not yet been** observed.

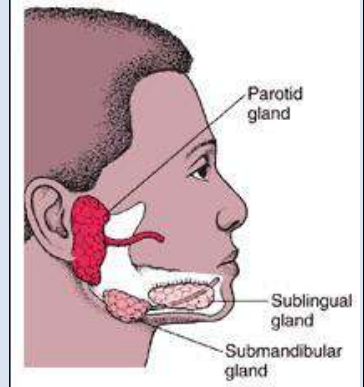
Dolutegravir

A recent report by the WHO highlighted that the Resistance to the dolutegravir drug is increasing among HIV patients

- Dolutegravir (DTG) is the World Health Organisation's (WHO) recommended antiretroviral drug preferred for first-line and second-line treatment of HIV/AIDS for all populations.
- It is more effective, easier to take, has fewer side effects than alternatives, and has a high genetic barrier to developing drug resistance.
- HIV is the virus that causes **Acquired Immune Deficiency Syndrome (AIDS)**.

Mumps virus

- Mumps is a **viral illness** caused by **a paramyxovirus** that spreads through airborne droplets from the Parotid Gland.
- **Symptoms** - Fever, malaise, body aches, muscle aches, loss of appetite and a general sense of listlessness.
- **Transmission** - Humans are the only known host for mumps virus which is transmitted from person to person through direct contact with saliva or droplets of the infected person.
- There is **currently no cure** for mumps.
- **Prevention** – It can be easily prevented with the **MMR (mumps, measles, rubella) vaccine**.

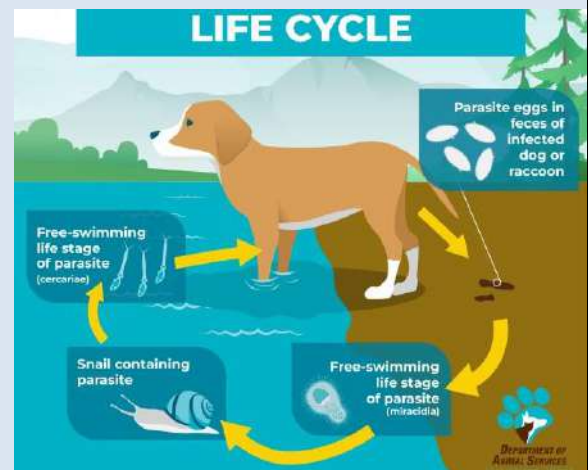


Heterobilharzia Americana

In a first, Southern California recently discovered a dog-killing flatworm parasite in the Colorado River.

- Heterobilharzia Americana is a flatworm also called a **liver fluke**, can cause **canine schistosomiasis**, which affects dogs' livers and intestines.
- The researchers found that 2 varieties of snails could transmit the parasite **Galba cubensis and Galba humilis**.
- It was previously predominantly observed in Texas and other Gulf Coast states, U.S.
- Treatments are available for infected dogs, these options do not always produce positive results and infections may eventually necessitate euthanasia.

H. americana is not directly transmitted between dogs or humans, can cause swimmer's itch, a red rash where it penetrates human skin.



Malaria in Odisha

National Centre for Vector Borne Diseases Control (NCVBDC) marks that Odisha has topped the list of states for malaria cases in 2023 with 18.7% recently.

- **Malaria** is a disease caused by a Plasmodium parasite.
- It is usually transmitted by the bite of infected female Anopheles mosquitoes.
- The severity of malaria varies based on the species of Plasmodium – Plasmodium falciparum and Plasmodium vivax are fatal.
- It is both preventable and curable.

Doctor to Population Ratio

- India surpasses World Health Organization guidelines with **1:900** doctor-to-population ratio recently.
- **World Health Organization recommendation**- Doctor to population ratio of **1:1000**.

MTBVAC

Bharat Biotech's TB vaccine MTBVAC begins clinical trials in India

- MTBVAC is derived from a human strain of the **Mycobacterium tuberculosis bacteria**.

- It was developed by Biofabri in collaboration with the Hyderabad-based Bharat Biotech.
- It is the **only tuberculosis (TB) vaccine currently available**, holds promise as a more effective and long-lasting alternative to the Bacille Calmette-Guérin (BCG).

TB claims over 1.6 million lives annually, infects more than 10 million worldwide each year and India holds the world's highest TB burden.

National Organ and Tissue Transplant Organisation (NOTTO)

The Union Ministry of Health and Family Welfare (MoHFW) has expressed concern over some States not compiling living and deceased donors' data.

- It is an apex organisation situated in New Delhi.
- It works under the Ministry of Health and Family Welfare.
- **Aim** - To provide for an efficient and **organised system of organ procurement and distribution** in the country, and maintain a national registry of donors and recipients of organs and tissues.
- It was established under the **Transplantation of Human Organs and Tissues Act (THOTA), 1994**.
- NOTTO also has a **National Organ Transplant Program (NOTP)** that aims to improve access to transplantation for needy citizens by promoting **deceased organ donation**.
- **Organ and tissue transplantation –**
 1. It is a surgical procedure that involves removing an organ, tissue, or group of cells from one person (the donor) and transplanting it into another person (the recipient), or
 2. Moving it from one site to another site in the same person.

Anthrax

- It is a serious infectious disease caused by gram-positive, rod-shaped bacteria known as **Bacillus anthracis**.
- It is also known as **malignant pustule or woolsorter's disease**.
- It occurs naturally in soil and commonly affects domestic and wild animals around the world.
- It is a **zoonotic disease**, meaning that it is naturally transmissible from animals (usually vertebrates) to humans.
- The U.S. Food and Drug Administration has approved 2 vaccines, **BioThrax and Cyfendus**, to prevent disease.

CoViNet

- The network will address a broader range of coronaviruses, including SARS-CoV-2, MERS-CoV and potential new **coronaviruses**.
- It currently comprises of 36 laboratories from 21 countries in **all 6 WHO regions** including 3 Indian laboratories.
- COVID-19 was the 1st **'Disease X'** and it may happen again.
- Disease X represents an unidentified virus that scientists warn could be 20 times more lethal than Covid-19.

INFORMATION TECHNOLOGY

10.23 Bitcoin Halving

Crypto traders and Bitcoin miners are preparing for Bitcoin halving that is predicted to happen in April 2024.

- Bitcoin is a form of **digital currency, created and held electronically** and aren't printed, like rupees or dollars.
- **Reward for mining –** It is given **to the person who solves the puzzles 1st** which is currently set at 6.25 Bitcoin (BTC).

- While the reward is set, the true value of this prize fluctuates based on BTC prices in the market, and when the owner chooses to sell.
- **Bitcoin Halving** – It refers to the 50% reduction in the reward paid to Bitcoin miners who successfully process other people's cryptocurrency transactions.
- **Occurrence** – It takes place after 2,10,000 blocks are mined, and has happened so far in 2012, 2016, and 2020, every 4 years.
- **Need** – This saved reward will be added to the public digital ledger known as the blockchain.
- **Significance** – Bitcoin mining increases the supply of BTC in circulation while the Bitcoin Halving reduces the rate at which these coins are released, making the asset scarcer.
- Scarcity is seen as pushing up prices, as is the case with gold.
- **Impact on investors** – It depends on the investor in question, and the extent of their involvement with Bitcoin and its ecosystem.
 - **For example**, a corporate-level miner will probably be desperate to earn their block reward in these last days.
 - A new trader who has invested a small sum of money might not even react to the news of the halving.
 - A more experienced trader might try increasing their Bitcoin investment hoping to profit from a possible price crash.
 - **Impact on crypto market** – It varies as every halving in Bitcoin's history has been wildly different.
 - It depends on varied factors like blockchain-related factors, diverse geopolitical events or economic shocks, among others.

10.24 IndiaAI Mission

Recently, Indian government announced the national-level IndiaAI Mission, a 'significant step' towards bolstering the country's artificial intelligence (AI) system.

- **Aim** – To establish a comprehensive ecosystem catalysing AI innovation through strategic programs and partnerships across public and private sectors.
- **Financial outlay** – **Rs. 10,371.92 crore**, over the next 5 years.
- **Nodal Ministry** – Ministry of Electronics and Information Technology (MEITY)
- **Implemented by** – IndiaAI Independent Business Division under Digital India Corporation.
- It has 7 key Components.
- **IndiaAI Compute Capacity** – To build scalable AI computing infrastructure by deploying more than 10,000 Graphics Processing Units (GPUs) through strategic public-private collaborations.
- An AI marketplace will be designed to offer AI as a service and pre-trained models to AI innovators.
- **IndiaAI Innovation Centre (IAIC)** – To undertake development and deployment of indigenous Large Multimodal Models (LMMs) and for retention of top research talent.
- **IndiaAI Datasets Platform** – To streamline access to quality non-personal datasets to ensure data-driven governance and catalyzing AI-based innovation and research.
- **IndiaAI Application Development Initiative** – To promote AI applications in critical sectors for problem statements sourced from Central Ministries, State Departments and other institutions.
- **IndiaAI FutureSkills** – To mitigate barriers to entry into AI programs and will increase AI courses undergraduate, masters-level and Ph.D. programs.
- Further, Data and AI Labs will be set up in Tier 2 and Tier 3 cities across India to impart foundational-level courses.
- **IndiaAI Startup Financing** – To support and accelerate deep-tech AI startups.
- **Safe & Trusted AI** – To enable implementation of Responsible AI projects with development of indigenous tools, self-assessment checklists, other guidelines and governance frameworks.

INDIAai is knowledge portal, research organisation and an ecosystem building initiative.

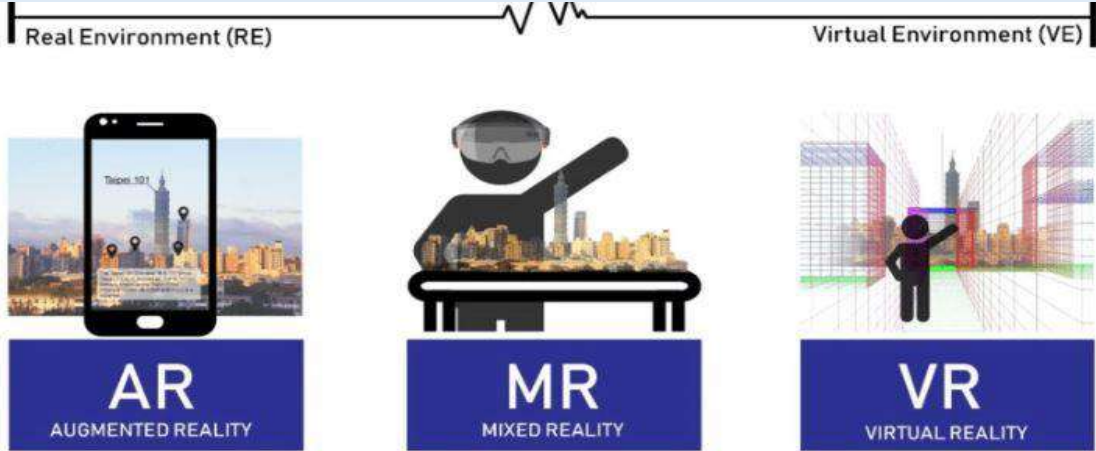
- **Significance** – It will further the vision of *Making AI in India and Making AI Work for India*.
- It will drive forward creativity and enhance internal capabilities, safeguarding *India's technological autonomy*.
- Additionally, it aims to *generate employment* opportunities, tapping into the country's demographic advantage.

10.25 Virtual Reality vs Augmented Reality vs Mixed Reality

Apple asked app developers, building applications for its Vision Pro, to call their apps 'spatial computing apps'.

- **Immersive Reality** – Immersive reality creates a new virtual reality by using 360-degree space.
- Like in Vortex, one can recreate a physical space, and enhance it with virtual objects to create an entirely new world with a perfect blend of real and virtual objects.
- Immersive-reality technologies use sensing technologies and spatial computing to help users see the world differently through mixed or augmented reality or see a different world through virtual reality.
- **Spatial computing** – It allows to use computer graphics, images and other functions in the backdrop of a physical space instead of a computer screen.
- It enables computers to blend in with the physical world in a natural way.

Extended Reality (XR) is an umbrella term encapsulating Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR), and everything in between.

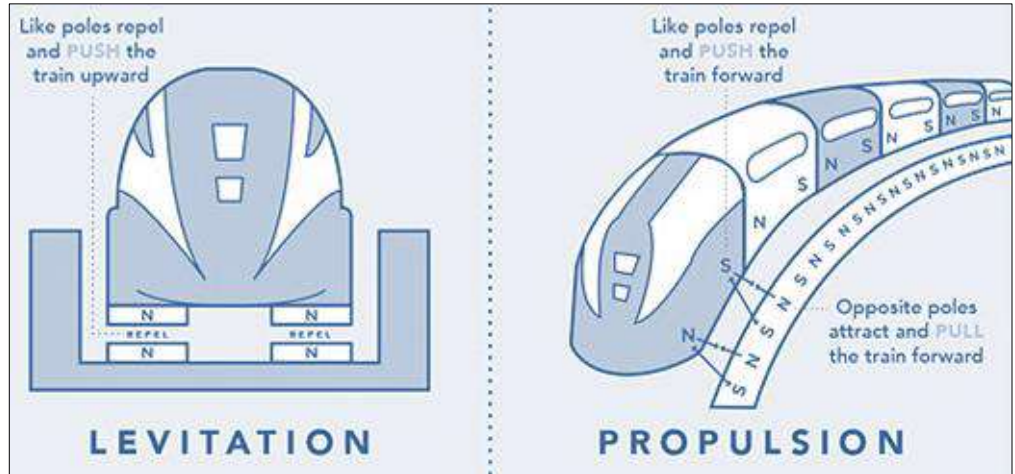
Virtual Reality (VR)	Augmented Reality (AR)
<ul style="list-style-type: none"> • It is a simulated 3D experience projected by a device into the user's sight. • These immersive simulations can create almost any visual or place imaginable for the player using special equipment such as computers, sensors, headsets, and gloves. • The users need to wear devices such as headgears or goggles to interact with the environment. • 360 VR – This technology is an interactive and immersive VR that allows the user to be in the middle of a virtually created scene. 	<ul style="list-style-type: none"> • This technology is used to add digital images on top of real-world scenarios. • The Snapchat filters and Pokemon Go are a great example of augmented reality. • It is the overlay of digital content on the real-world environment. • It uses different tools to make the real and existing environment better and provides an improved version of reality.
Mixed Reality (MR)	
<ul style="list-style-type: none"> • It is a mix of virtual reality and augmented reality in which one can interact with the digital as well as the real world simultaneously. • It integrates digital objects and real-world in such a way that it makes it look like the objects really belong there. 	<div style="display: flex; justify-content: space-between; border-bottom: 1px solid black; padding-bottom: 5px;"> Real Environment (RE) Virtual Environment (VE) </div>  <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>AR AUGMENTED REALITY</p> <p><small>Digital content from virtual world on top of real environment, providing information.</small></p> </div> <div style="text-align: center;"> <p>MR MIXED REALITY</p> <p><small>Virtual and Real Environment mix and interact with each other.</small></p> </div> <div style="text-align: center;"> <p>VR VIRTUAL REALITY</p> <p><small>Immersive virtual environments shut out the real world.</small></p> </div> </div>

10.26 Hyperloop Technology

A Switzerland-based hyperloop company *Swisspod Technologies* signed a memorandum of understanding (MoU) with *TuTr Hyperloop*, a spin-off of IIT Madras to develop hyperloop systems in India.

- **Origin-** It is a proposed ultra-high-speed, ground-level, solar-powered cargo and mass transportation system conceptualized in 2013 by American entrepreneur Elon Musk.
- **Technology-** It is the 5th mode of transportation Hyperloop which works on a technology that would use *magnetic levitation* in low-pressure tubes to transport people and goods at airplane-like speeds.

- **Maglev-** It is the system in which the vehicle runs levitated from the guide way (corresponding to the rail tracks of conventional railways).



- **Need-** It seeks to eliminate the limitations of friction and air resistance, enabling high-speed travel with minimal energy.

- **Low-pressure system-** Elon Musk's design proposes a more practical low-pressure system as opposed to a full vacuum, using an electric compressor fan for pressure maintenance and air bearings for low friction².
- **Capsule movement-** Capsules are propelled at high speeds within a low-pressure tube, lifted by air cushions, requiring minimal external acceleration except for initial speed gain and periodic boosts.
- **Components-**
 - **Tube-** A partially evacuated cylindrical tube serves the purpose that tracks do in a conventional railway system.
 - **Capsules/ pods-** They are sealed vessels used to transport passengers and/or cargo.
 - **Stations-** They are constructed for the boarding and unboarding of passengers and cargo.
- **Active infrastructure-** It is used in maglev systems, requires magnets to be installed along the entire track length which can lead to exorbitant costs and heightened risks, as the failure of even a single magnet could compromise the entire system's reliability.
- **Passive infrastructure-** Swisspod technologies adopt this approach which involves placing electromagnets on the vehicle itself, eliminating the need for magnets along the track.
- **Benefits-** It is a safer, faster, economical, convenient, weather and disaster-resistant, sustainable, and non-Disruptive Travel.

Hyperloop in India

- **Virgin hyperloop-** It was established in 2014 which plans to set up routes primarily over the US, India and Saudi Arabia, it expects to begin carrying passengers as soon as 2027.
- **Maharashtra hyperloop plan-** The proposed route aims to connect Mumbai and Pune in the state of Maharashtra which reduces the travel time from 3 hours (by road) to just 25 minutes.

10.27 Embedded SIM

TRAI releases recommendations on 'Usage of Embedded SIM for Machine-to-Machine (M2M) Communications'.

Machine-to-Machine (M2M) Communications

- M2M is a broad label that can be used to describe any technology that enables networked devices to exchange information and perform actions without the manual assistance of humans.
- Artificial intelligence (AI) and machine learning (ML) facilitate the communication between systems, allowing them to make their own autonomous choices.

- M2M uses a device to capture an event, which is relayed through a network to an application that translates the captured event into meaningful information.
- **Applications** – Smart home meters, vehicle telemetry services, asset tracking, wearable technologies, and automated supply chain management (SCM).

Subscriber Identity Module (SIM)

- A **SIM** (Subscriber Identity Module), also called a Universal Integrated Circuit Card or UICC, stores information that uniquely identifies a cellular subscription.
- SIM holds the credentials and security keys necessary to identify a subscriber.
- That identity comes in the form of a so-called IMSI number, or International Mobile Subscriber Identity, which is unique for every user or device on or off the network.

Embedded SIM	Electronic SIM (eSIM)
<ul style="list-style-type: none"> • An embedded SIM is a SIM card that cannot be removed from a device. • Traditional SIM cards are made so that they can easily be swapped out of a phone, so that core service information can get ported from one physical device to another. • With an embedded SIM, the chips are made to allow for information switching, so that the actual physical chip would not get removed from the device. • When using embedded SIM, customers would not need to order replacement SIM cards and physically integrate them into their phones. • The idea is that manufacturers would use the same SIM card across the industry. • However, embedded SIM cards include less customer freedom to adjust the device from one provider to another. 	<ul style="list-style-type: none"> • eSIM is a hardware that runs an application called eUICC, which has storage to hold multiple SIM profiles at the same time (but only one can be active), and can be provisioned remotely, over the air (OTA). • eSIM is a SIM that can load new carrier profiles digitally, over the air, which means one no longer need to physically swap SIM cards in their devices. • The profiles stored on an eSIM can be modified remotely, through software and API calls, without needing to physically swap SIMs. • An eSIM can hold multiple SIM profiles at the same time, which can give a device access to multiple completely different carriers, however, only one SIM can be active at a time.

Other Important Topics

Haiper

- Haiper is a free **text-to-video** generative AI tool.
- It helps users to create video content, animated static images, video repainting tools.
- It is developed by Yishu Miao and Ziyu Wang of Haiper.
 - **Sora** is a text-to-video generator created by OpenAI

Pi

- **1st emotionally intelligent AI chatbot** with which one can have deep and meaningful conversations.
- It is launched by **Inflection AI**, a California-based AI startup
- It is designed to understand natural language, generate relevant, engaging responses, etc.

Hyodol

South Korean company Hyodol has come up with a social robot.

- Hyodol is a **social robot** that uses AI to **help older people with dementia** and those who are digitally disadvantaged.

- It is developed by Hyodol, AI companion chat robot platform in South Korea.
- The AI social robot helps senior citizens beat loneliness, and aid people with dementia.
- Hyodol collects lifelog data using interactive AI care robots based on the latest AI and Home IoT technology.

Devin AI

- Devin is the ***world's '1st fully autonomous' AI software engineer***,
- It can write codes, create websites, and software with just a single prompt.
- It is created by the ***US-based applied AI lab, Cognition***.
- Other popular AI-powered tools that help with coding are OpenAI Codex, GitHub Copilot, Polycoder, CodeT5, Tabnine, etc.

SIMA (Scalable Instructable Multiworld Agent)

- Google DeepMind recently revealed its latest AI gaming agent Scalable Instructable Multiworld Agent (SIMA) to perform tasks across video game environments.

Project GROOT

- **GROOT** stands for "**Generalist Robot oo Technology**" developed by ***NVIDIA Corporation***, U.S. based multinational technology company on AI and GPUs.
- Project GROOT is a foundation model for humanoid robots that helps them learn through simulation and in the real world.
- It is a general-purpose model that allows robots to function as "minds".
- It takes multimodal instructions & past interactions as input & produces the next action for the robot.

NUCLEAR TECHNOLOGY

10.28 White Rabbit technology

CERN launches the White Rabbit Collaboration.

- White Rabbit (WR) is a technology developed at European Organization for Nuclear Research (CERN).
- It synchronizes devices in order to solve the challenge of establishing a common notion of time across a network.
- It's an open-source, fully deterministic Ethernet-based network for time synchronization and general-purpose data transfer.
- It was included in the worldwide industry standard known as ***Precision Time Protocol (PTP)***, governed by the Institute of Electrical and Electronics Engineers (IEEE).

10.29 Nuclear Energy Summit

Brussels hosted a first-of-its-kind Nuclear Energy Summit, billed as the most high-profile international meeting on nuclear energy ever.

- **Aim** - To highlight the role of nuclear energy in addressing the global challenges to reduce the use of fossil fuels, enhance energy security and boost economic development.
- **Organized by** - International Atomic Energy Agency (IAEA).
- The meeting was not meant to produce any decisions or agreement rather, it was another attempt to build momentum for a greater acceptance of nuclear energy.
- ***India participated*** in this summit and committed to achieving net zero emissions by **2070** and that nuclear energy should have a significant share in India's electricity mix by **2047**.

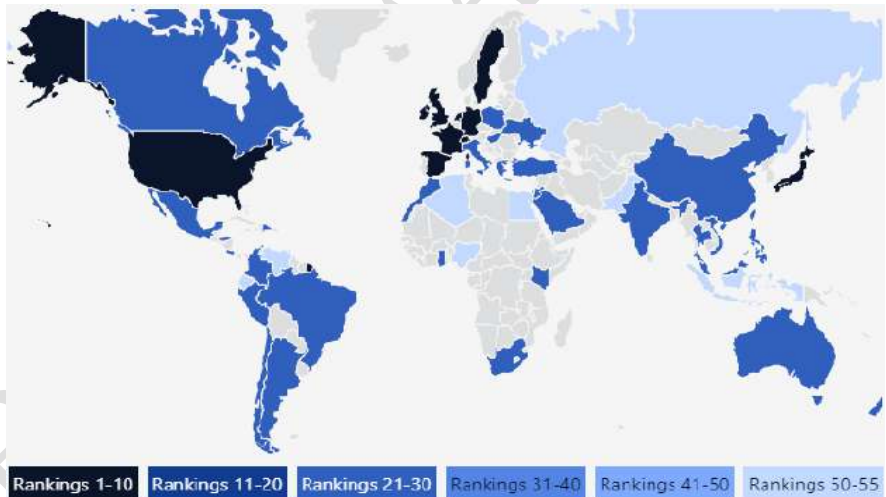
11. INDICES AND REPORT

11.1 International IP index

India ranks 42 out of 55 in the 12th edition of International Intellectual Property Index.

- **Aim** – To show economies how to improve IP-driven innovation and creativity and to reveal trends in global IP protection.
- **Released by** – US Chamber of Commerce released the 12th edition of its International IP Index.
- **Findings of the report** – It is based on 50 unique indicators.
- A significant improvements in 20 economies.
- While the United States is once again the world leader, there were notable advancements led by Saudi Arabia, Brazil, and Nigeria.
- 27 economies showed no change and 8, including Ecuador, experienced declines due to weak IP enforcement.
- India's overall score remained unchanged at 38.64%.
- **India's IP strength** – Cinematograph (Amendment) Bill 2023, which includes new language and criminal sanctions on film piracy.
- Issuing of "dynamic" injunction orders, R&D and IP-based tax incentives.
- **India's IP weakness** – 2021 dissolution of the Intellectual Property Appellate Board.
- An under-resourced and overstretched judiciary affects rights holders' ability to enforce their IP rights and to resolve IP-related disputes.
- Limited framework for the protection of biopharmaceutical IP rights.
- Recognizing the critical link between IP rights and economic activity will underscore India's global competitiveness.
- **Significance** – It demonstrates the benefits that economies can receive when they adopt robust and enforceable IP standards.
- It serves as a compass to guide world leaders on proven methods to champion innovation and creativity at home.

In Patents, 23 economies score above 70%, with India and Pakistan making notable legislative changes.



11.2 Global Waste Management Outlook

The report 'Turning rubbish into a resource: Global Waste Management Outlook 2024' was launched during the 6th UN Environmental Assembly (UNEA-6) at the UNEP headquarters in Nairobi, Kenya.

- **Published by** – UN Environment Programme (UNEP) and the International Solid Waste Association (ISWA).
- **2024 report** – It provides an update on global waste generation and the cost of waste and its management since 2018 with main focus municipal solid waste.
- **Key findings** – Municipal solid waste generation is predicted to grow to 3.8 billion tonnes by 2050.
- Municipal solid waste, an equivalent of 27% of the global total waste, is not being collected.

In the developed and upper middle-income regions of the world, almost all of the waste is collected between 83% for the Caribbean and 99% for North America.

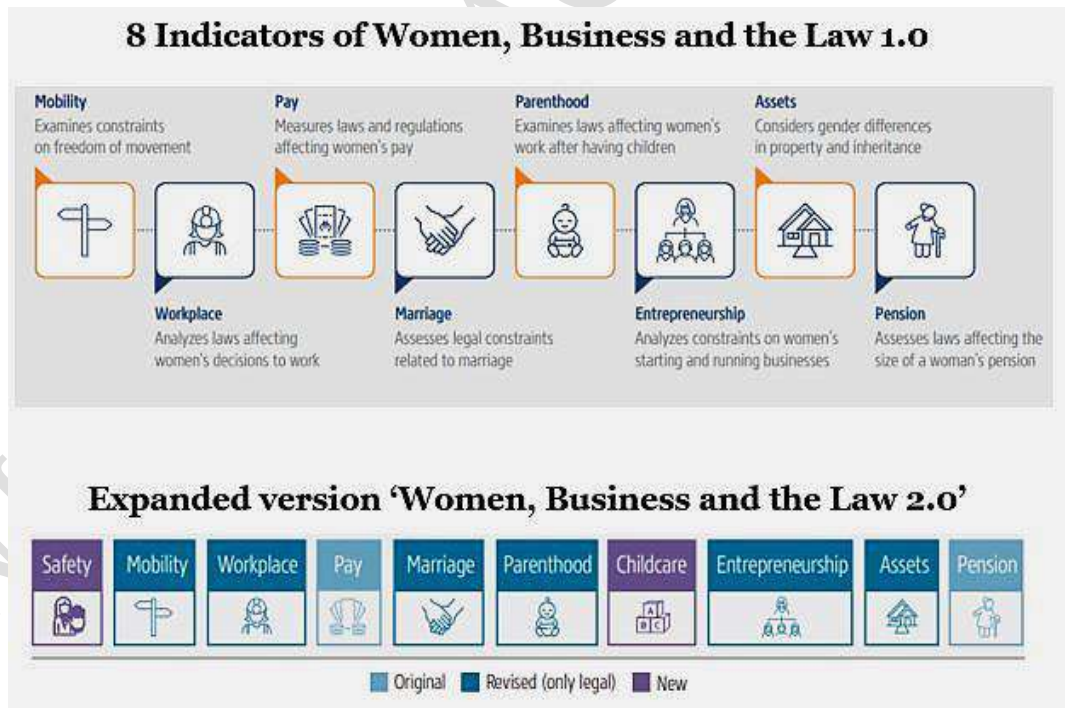
- More than a third of the world's population is drowning in waste.
- Over 2.7 billion people in the Global South and developing regions of the world not having their waste collected.
- By 2050, the global annual cost of waste management could almost double than 2020 levels.
- Waste prevention and management measures could limit net annual costs by 2050 to USD 270.2 billion.
- **Recommendations** – Multinational development banks and donors can support proven zero waste and circular economy initiatives.
- National governments can legislate to deliver the waste hierarchy, incentivise zero waste business models, and apply producer responsibility fees to prioritise waste reduction.
- Emphasis on 'upstream' measures at manufacturing stage, as opposed to 'downstream' measures which involved managing waste.
- Prioritize municipal solid waste management.
- **India** – The thriving street food sector across India depends heavily on single-use plastics (SUP), which translate into a nationwide waste management burden and cost to society.
- Adopting a reusable packaging system would translate into being both economically viable and environmentally sustainable.

Waste contributes to the triple planetary crisis of pollution, climate crisis, and biodiversity loss.

11.3 Women, Business and the Law Report 2024

The 10th edition of the women, business and the law report was published recently.

- An annual studies measuring the laws that affect women's economic opportunity.
- **Published by – World bank**
- **Coverage – 190 economies.**
- **For the 1st time** – It analysed the impact of childcare & safety policies on women's participation in the labour market.
- It presents a new approach to measure the implementation gap between laws (de jure) and how they function in practice (de facto).



- **10 indicators** – Safety, Mobility, Workplace, Pay, Marriage, Parenthood, Childcare, Entrepreneurship, Assets, and Pension.

Key Findings of the Report

- **Workplace** – No country in the world affords women the same opportunities as men in the workforce.
- **Global gender gap** – It was far wider than previously thought and closing this could raise global GDP by more than 20%.
- **Pay** – Globally, women earned just 77 cents of each dollar earned by a man.
- **Pension** – In 81 countries, a woman's pension benefits do not account for periods of work absences related to childcare.

- **Parenthood** – Less than 50% the countries had financial support or tax relief for parents of young children.
- **Safety** – 151 countries had laws against sexual harassment in the workplace but only 40 countries had laws that covered abuse in public areas or on public transport.
- **Childcare** – Addressing the childcare gap would immediately lead to a 1% increase in women's participation in the labour force.
- **Legal gap** – Countries on average, established less than 40% of the systems needed for full implementation.
- Women on average enjoyed just 64% of the legal protections men do, down from the previous estimate of 77%.

11.4 World Poverty Clock

The latest data of World Poverty Clock showed India has managed to bring down 'extreme poverty' below 3% of its population.

- The World Poverty Clock provides real-time estimates until 2030 for almost every country in the world.
- It monitors progress against Ending Extreme Poverty, which is the UN's first Sustainable Development Goal (SDG). The escape rate calculates the current rate of poverty reduction in the world.
- The World Poverty Clock was developed by **World Data Lab**, a global data enterprise.
- It was funded by the International Fund for Agricultural Development (IFAD) and the Federal Ministry for Economic Cooperation and Development of Germany.

11.5 Zero-food children

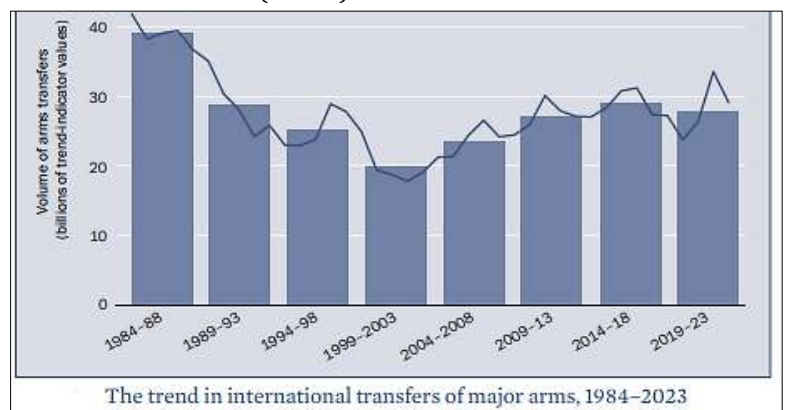
India has ranked high in a recent study calculating the prevalence of zero-food children across 92 Low and Middle-Income Countries (LMIC).

- Zero-food children are infants or toddlers aged between 6 months and 24 months who have not received any milk or solid or semisolid food over a 24-hour period.
- **Recent Findings** - India ranked **3rd with 19.3%** 'zero-food' children after west African countries Guinea (21.8%) and Mali (20.5%).
- The figures are much lower in Bangladesh (5.6%), Pakistan (9.2%), DR Congo (7.4%), Nigeria (8.8%) and Ethiopia (14.8%).

11.6 Trends in International Arms Transfers, 2023 Report

According to a new report 'Trends in International Arms Transfer 2023, India continues to be the world's top arms importer.

- **Published by** – Stockholm International Peace Research Institute (SIPRI).
- **Study period** – 2019-2023
- **Export regime** – The **5 largest exporters** were the United States, France, Russia, China and Germany.
- For the 1st time, France became the 2nd biggest arms exporter after the USA.
- The USA and Western Europe together accounted for 72% of all arms exports in 2019-2023.
- **Imports** – The **5 largest arms importers** were India, Saudi Arabia, Qatar, Ukraine and Pakistan.



- States in Asia and Oceania accounted for 37% of all arms imports, followed by states in the Middle East, Europe, the Americas and Africa.
- For the 1st time in 25 years, the US has become the largest supplier to Asia and Oceania.

- Pakistan is 5th largest arms importer in 2019-23 where China provides 82% of arms imports.
- **India** – Its arms imports increased by 4.7% between 2014–2018 and 2019–2023.
- Russia is India's main-arms-supplier, accounting for 36 % of its arms imports.
- **India & France** – India was the largest single recipient of French arms exports, accounting for nearly 30%.
- The Indian Air Force operates 36 Rafale fighter jets customised in accordance to its needs.
- Furthermore, India is in talks for 26 Rafale Marine jets to be procured for the Navy's aircraft carrier INS Vikrant from France.

The period between 2014 and 2018 was the 1st 5-year stretch in 50 years (since 1960-1964) when deliveries from Russia or the erstwhile Soviet Union (prior to 1991) made up less than half of India's arms imports.

11.7 Democracy Report 2024

India was downgraded on multiple metrics to emerge as one of the worst autocratisers according to the Democracy Report 2024.

- It is an **annual** democracy report released by the **Gothenburg-based V-Dem Institute**.
- The report categorizes countries into 4 regime types based on their score in the Liberal Democratic Index (LDI)
 1. Liberal Democracy
 2. Electoral Democracy
 3. Electoral Autocracy
 4. Closed Autocracy
- The report maps each country on a matrix of whether they are turning more democratic (democratising) or more autocratic (autocratising).

India was downgraded to the status of an electoral autocracy in 2018.

Findings

- According to the report in 2023, 71% of the world's population live in autocracies, 42 countries (home to 35% of the world's population) were undergoing autocratisation.
- India (18% of the world's population) accounts for about half of the population living in autocratising countries.
- Democratisation was taking place only in **18 countries**, accounting for just 5% of the world's population.

11.8 Global Methane Tracker 2024

The recent 'Global Methane Tracker 2024' reports that methane emissions from fossil fuels remain high despite progress.

- It is an annual report released by **International Energy Agency (IEA)**
- **Aim** – To bring down methane emissions from across the energy sector and implement the new Global Methane Pledge.
- **2024 tracker** – For the 1st time, a complete set of country-level estimates for methane emissions from the energy sector is given.
- **Key findings** – Some 40% of methane is released from natural sources, mainly wetlands while 60% from human activities.
- Among human activities, agriculture is the main source of methane emission followed by energy sector (oil, natural gas, coal and bioenergy) which contributes third of human origin emission.
- Methane emissions from fuel use in 2023 were close to being the highest ever at 120 million tonnes (Mt).
- Close to 70% of methane emissions from fossil fuels come from the top 10 emitting countries.

Methane is far more powerful than CO₂ at trapping heat in the atmosphere but relatively short-lived. It is responsible for around 30% of the rise in global temperatures since the preindustrial era.

The United States, being the largest emitter of methane from oil and gas operations, topped the list, followed by Russia.

- Around 40% of methane emissions from fossil fuels recorded in 2023 could be avoided at no net cost.
- Cutting methane emissions from fossil fuels by 75% by 2030 is vital to limit warming to 1.5 °C
- Full implementation of COP28 and other pledges would cut fossil fuel methane emissions by 50%.
- Delivering the 75% cut in methane emissions requires USD 170 billion in spending to 2030

Quick Facts

- **Oil and Gas Decarbonisation Charter** – It was launched more than 50 oil and gas companies, representing more than 40% of global oil production, to speed up emissions reductions within the industry at COP28.
- **1st Global Stocktake (GST)** – It was released at COP28, called for countries to accelerate and substantially reduce non-carbon-dioxide emissions globally, including methane, by 2030.
- But it stopped short of providing a quantifiable target.

More than 150 countries have promised a 30% reduction by 2030. Oil and gas firms have meanwhile pledged to slash methane emissions by 2050.

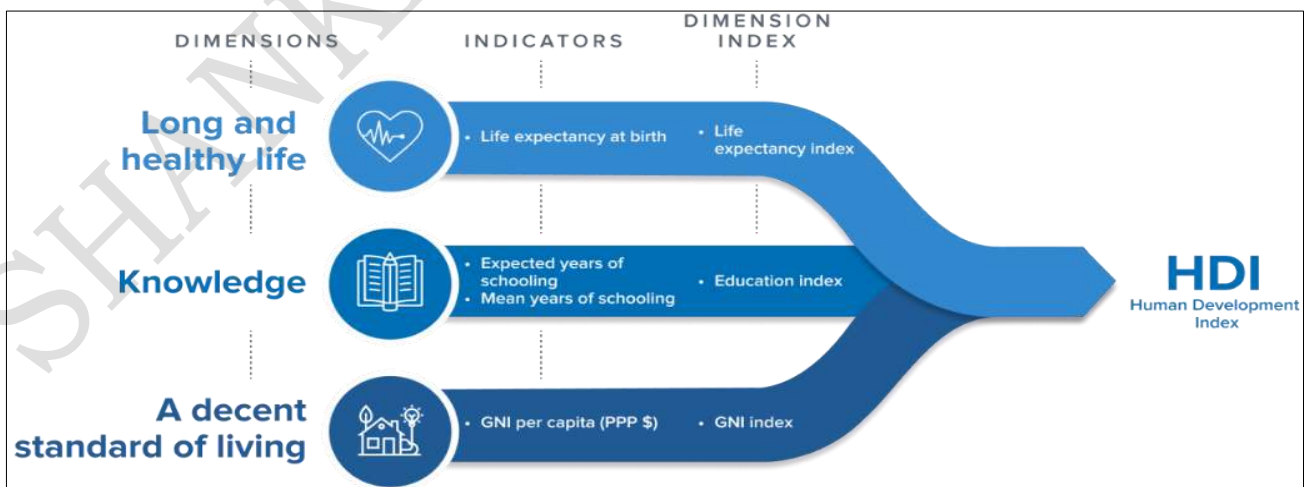
11.9 Global Connectedness Report, 2024

- **By** - DHL and New York University's Stern School of Business
- It ranked the connectedness of 181 countries, accounting for 99.7% of the world's gross domestic product.
- **India's Ranking** - India ranks 62nd out of 181 economies, based on 2022 data tracking global flows of trade, capital, information and people.
 - Breadth of merchandise trade (reach of India's exports and imports across global markets) – Ranks **9**
 - Depth of merchandise trade (size of India's international flows relative to its domestic activity) – Ranks **161**

11.10 Human Development Index (HDI)

India has moved up a rank to 134 in the 2023/24 Global Human Development Index (HDI).

- **Created by** – United Nations Development Programme (**UNDP**) in 1990.
- It is the *geometric mean of normalized indices* for each of the **3 dimensions** that are measured with **4 indicators**.
 - A long and healthy life
 - Being knowledgeable
 - Having a decent standard of living.



- **Aim** – To emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone.
- **HDI scores** – Range from **0 to 1**, with higher values indicating higher levels of human development.
- **4 HDI categories** – Very High, High, Medium and Low human development.

- **2023/24 HDI Report** – Titled ‘Breaking the Gridlock: Reimagining cooperation in a polarized world’.
- It ranks 193 countries in 2022 compared to 191 countries in 2021.

UNDP also publishes *Inequality-Adjusted Human Development Index (IHDI)*, *Gender Development Index (GDI)* whereas the *Augmented Human Development Index (AHDI)* is produced by the economic historian *Leandro Prados de la Escosura*.

Key Findings	
Top performers	Bottom performers
<ul style="list-style-type: none"> • <u>Switzerland</u> • Norway • Iceland 	<ul style="list-style-type: none"> • Central African Republic • South Sudan • Somalia
India’s case	
<ul style="list-style-type: none"> • India has moved up a rank to 134 compared to 2021 in the Medium Human Development category. • But still, it falls behind Bangladesh, Sri Lanka and Bhutan. 	

- **Concerns** – The *widening human development gap* shows that the 2-decade trend of steadily reducing inequalities between wealthy and poor nations is now in reverse.
- A ‘*democracy paradox*’, coupled with a sense of powerlessness & lack of control over government decisions, has fuelled political polarisation & inward-looking policy approaches.
- **India’s improvement** – Life expectancy at birth has slightly improved from 67.2 years in 2021 to 67.7 years in 2022.
- There is an overall increase (5.88%) in expected years of schooling (EYS) from 11.9 years to 12.6 years.
- The Gross National Income (GNI) per capita also improved from \$6,542 to \$6,951.

Democracy paradox is a state, where most of the people surveyed expressing support for democracy but also endorsing leaders who may undermine democratic principles.

India, Bhutan and Bangladesh are all in the medium category while Sri Lanka and China are in High HDI category. Nepal and Pakistan have been ranked lower than India.

11.11 Report on Neonatal deaths

The recent report by United Nations Inter-agency Group for Child Mortality Estimation noted that the annual number of global under-5 deaths in 2022 declined by more than half.

- **Neonatal deaths** - Number of deaths during the first 28 completed days of life per 1000 live births in a given year or other period.
- **Classification**
 - **Early neonatal deaths** - Occur within the first 7 days of life.
 - **Late neonatal deaths**- Occur between 7 to 28 days.
- **Causes** -Preterm birth, low birthweight and birth defects.
- Globally, neonatal deaths happened every 14 seconds, a child aged under 5 died every 6 seconds and an adolescent died every 35 seconds in 2022.

United Nations Inter-agency Group for Child Mortality Estimation (UN IGME)

- UN IGME is a technical group that produces annual estimates of child and adolescent mortality.
- It was *established in 2004* to share data, improve methods, and report on progress towards child survival goals.
- It includes representatives from UNICEF, WHO, the World Bank, and the United Nations Population Division.

11.12 Fair share for health and care report

- Fair share for health and care is a new report by the **World Health Organization**, addressed the gender gap in global healthcare.

Findings

- Women comprises 67% of the global health and social care workforce but facing an average pay gap of 24% compared to men.
- Globally, 90% of women's earnings were directed towards their families' well-being, compared to only 30–40% of men's earnings.
- Women made up 25% to 60% of doctors, but between 30% and 100% of nursing staff across 35 countries.
- Unpaid health work adds value to health contributions, and 76% of unpaid care activities are performed by women.
- In India, women spent around 73% of their total daily working time on unpaid work, compared to men who spent around only 11% of their daily working time on unpaid work.

11.13 World Air Quality Report 2023

Delhi world's most polluted capital, India has 3rd worst air quality – World Air Quality Report.

- **Released by** – Swiss organisation IQAir.
- **IQAir** – A Swiss air quality technology company, prepares the annual world air quality reports based on data from monitoring stations operated by governments, institutions and organisations across the world.
- **Data** – Report includes 7,812 locations in 134 countries, regions and territories.
- **Key Findings** – **India** had the **third-worst air quality** out of 134 countries in 2023 after Bangladesh and Pakistan.
- **PM_{2.5} Concentration** – India (54.4 micrograms per cubic metre), Bangladesh (79.9 micrograms per cubic metre) and Pakistan (73.7 micrograms per cubic metre).
- In 2022, India was ranked as the eighth most **polluted** country with an average PM_{2.5} concentration of 53.3 micrograms per cubic metre.
- **Delhi** – Delhi's **PM_{2.5} levels** worsened from 89.1 micrograms per cubic metre in 2022 to 92.7 micrograms per cubic metre in 2023, taking it to the top spot in the world's most polluted cities list.
- The **national capital** was ranked the most polluted capital city in the world four times on the trot starting in 2018.
- **Begusarai** – Begusarai, in Bihar stood out as the most polluted metropolitan area globally with an average PM_{2.5} concentration of 118.9 micrograms per cubic metre.
- The city did not even figure in the 2022 rankings.
- **Impact** – Exposure to PM_{2.5} air pollution leads to and exacerbates **numerous health conditions**, including but not limited to asthma, cancer, stroke and lung disease.
- Exposure to elevated levels of fine particles can impair cognitive development in children, lead to mental health issues, and complicate existing illnesses, including diabetes.

According to the WHO, air pollution is responsible for an estimated 7 million premature deaths worldwide every year.

The IQAir report for 2022 had stated that roughly 60% of cities in India had recorded annual PM_{2.5} levels at least seven times higher than the WHO guidelines (annual guideline level at 5 micrograms per cubic metre).

It is estimated that 1.36 billion people in India experience PM_{2.5} concentrations exceeding the World Health Organisation (WHO) recommended annual guideline level of 5 micrograms per cubic metre.

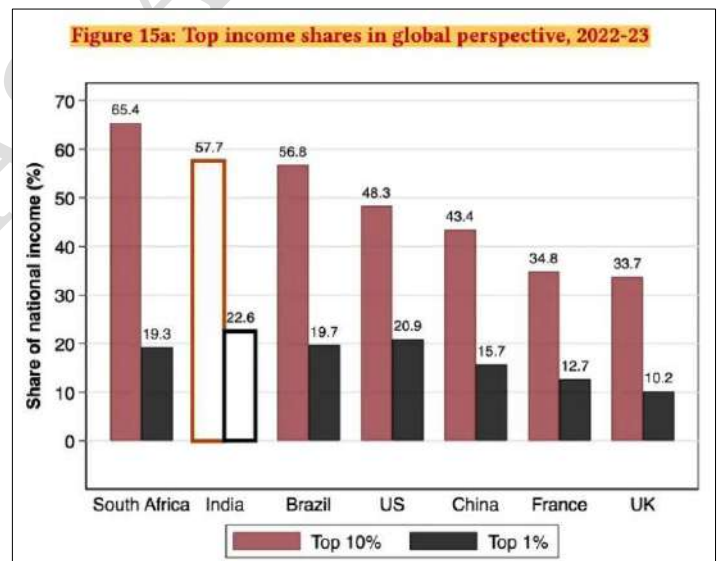
11.14 Income and Wealth Inequality in India, 1922-2023

Data on India for a century has revealed income and wealth inequality now as being worse than during British colonial rule, according to the World Inequality Lab.

- Released by **World Inequality Lab (WIL)**, a Paris based global research center focused on the study of inequality and public policies that promote social, economic and environmental justice.
- Findings** – By 2022-23, top 1% income and wealth shares (22.6% and 40.1%) are at their highest historical levels.
- India's top 1% income share is among the very highest in the world, higher than even South Africa, Brazil and US.
- Billionaire raj** – It says the 'billionaire raj' is now more unequal than the British colonial raj.
- Billionaire raj is the term used to define the post – 2010s rapid rise of billionaires in the country.
- It makes two other observations, one on income tax being regressive, and the other being the poor economic data, which has seen a decline recently.
- Inequality has been rising sharply in India since the 1980s, between 2014-15 and 2022-23, the rise of top-end inequality has been particularly pronounced in terms of wealth concentration.

Key Takeaways

- Inequality** – Inequality declined post-independence till the early 1980s, after which it began rising and has skyrocketed since the early 2000s.
- Trends of top income and wealth shares track each other over the entire period of the study.
- 2014-15 & 2022-23** – Between 2014-15 and 2022-23, the rise of top-end inequality has been particularly pronounced in terms of wealth concentration.
- By 2022-23, top 1% income and wealth shares (22.6% and 40.1%) are at their highest historical levels.
- India's top 1% income share is among the very highest in the world, higher than even South Africa, Brazil and US.
- Income Tax** – In line with earlier work, the paper finds suggestive evidence that the Indian income tax system might be regressive when viewed from the lens of net wealth.
- A restructuring of the tax code to account for both income and wealth, and broad-based public investments in health, education and nutrition are needed to enable the average Indian.
- Super Tax** – A super tax of 2% on the net wealth of the 167 wealthiest families in 2022-23 would yield 0.5% of national income in revenues and create valuable fiscal space to facilitate such investments.
- Super tax serves as a tool to fight inequality.



11.15 The Global E-waste Monitor 2024

According to the *Global E-waste Monitor (GEM)*, the world's generation of electronic waste is rising five times faster than documented e-waste recycling.

- E-waste** - Electronic waste refers to all items of electrical and electronic equipment (EEE) and its parts that have been discarded by its owner as waste without the intent of re-use.
- It is also referred to as **WEEE (Waste Electrical and Electronic Equipment)**.
- Regulation of e-waste in India** - The ***E-Waste (Management) Rules, 2022*** provided for a new Extended Producer Responsibility (EPR) regime for e-waste recycling in India.

- Producers of notified EEE, have been given annual E-Waste Recycling targets starting from 60% for 2023-2024 and 2024-25; 70% for 2025-26 and 2026-27 and 80% for 2027-28 and 2028-29 and onwards.

The Global E-waste Monitor 2024

- It provides the most up-to-date overview of global e-waste data, statistics, and progress in policy and regulation since 2014.
- Prepared by** - Global E-waste Statistics Partnership (GESP) with the support from Fondation Carmignac, a corporate foundation.

Global E-waste Statistics Partnership (GESP)	
<ul style="list-style-type: none"> In 2017, the International Telecommunication Union (ITU), United Nations University – Sustainable Cycles (UNU-SCYCLE) and the International Solid Waste Association (ISWA), joined forces to create the GESP. Since 2022, Sustainable Cycles (SCYCLE) became a programme under the United Nations Institute for Training and Research (UNITAR). The GESP is now a Partnership managed by the ITU and UNITAR-SCYCLE. 	

Findings of Global E-waste Monitor 2024

- E-waste production** - A record 62 million tonnes of e-waste was produced in 2022, 82% up from 2010.
- It will rise another 32% to 82 million tonnes in 2030.
- Just 1% of rare earth element demand is met by e-waste recycling.
- Recycled waste** - Less than one quarter (22.3%) of the year’s e-waste mass was documented as having been properly collected and recycled in 2022.

- Among regions, Europe has the highest rate of documented formal collection and recycling of e-waste at 42.8% while Africa generates the lowest rates of e-waste but struggles to recycle it.

	E-waste generated	E-waste generated	E-waste documented as formally collected and recycled
Global Scenario	62 billion kg	7.8 kg/capita	13.8 billion kg
India’s Case	4137 million kg	2.9 kg/capita	59.6 million kg

- Per-capita e-waste** - Europe (17.6 kg), Oceania (16.1 kg) and the Americas (14.1 kg) generated the highest amount of e-waste per capita in 2022.

- Challenges** - Technological progress, higher consumption, limited repair options, shorter product life cycles, society’s growing electrification, design shortcomings, and inadequate e-waste management infrastructure.
- Future perspective** - If countries could bring the e-waste collection and recycling rates to 60% by 2030, the benefits through minimizing human health risks would exceed costs by more than 38 billion dollars.

11.16 India Employment Report 2024

The recently released India Employment Report 2024 has highlighted the issue of high unemployment amongst India’s educated youth.

- Unemployment is the condition of one who is capable of working, actively seeking work, but unable to find any work.
- Report prepared by** – Institute for Human Development (IHD) and International Labour Organisation (ILO).

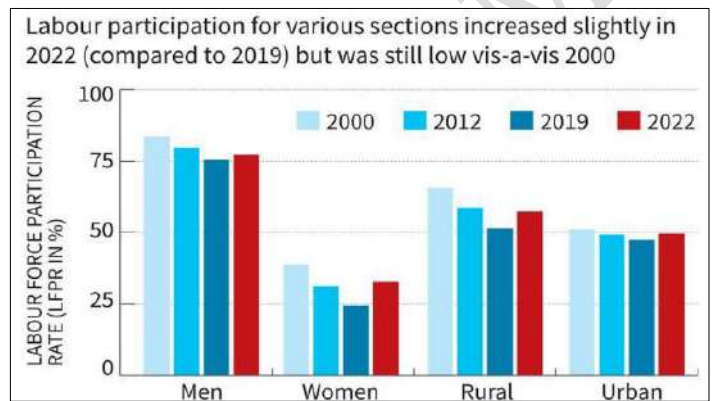
Key findings

- Unemployment** – India’s youth account for almost **83%** of the unemployed workforce.
- The Labour Force Participation Rate, Worker Population Ratio and the Unemployment Rate showed a long-term deterioration between 2000 and 2018, but witnessed an improvement after 2019.

A GLIMPSE: INDIAN LABOUR MARKET

- Employment in India is predominantly self-employment and casual employment
- Transition to non-farm employment reversed due to the pandemic, with a rise in the share of agricultural employment
- Women largely account for the increase in self-employment and unpaid family work
- Employment generation in India has become more and more capital-intensive, with fewer workers employed between 2000 and 2019 than in the 1990s
- Digitalisation and introduction of new technologies are changing the structure of industrial employment

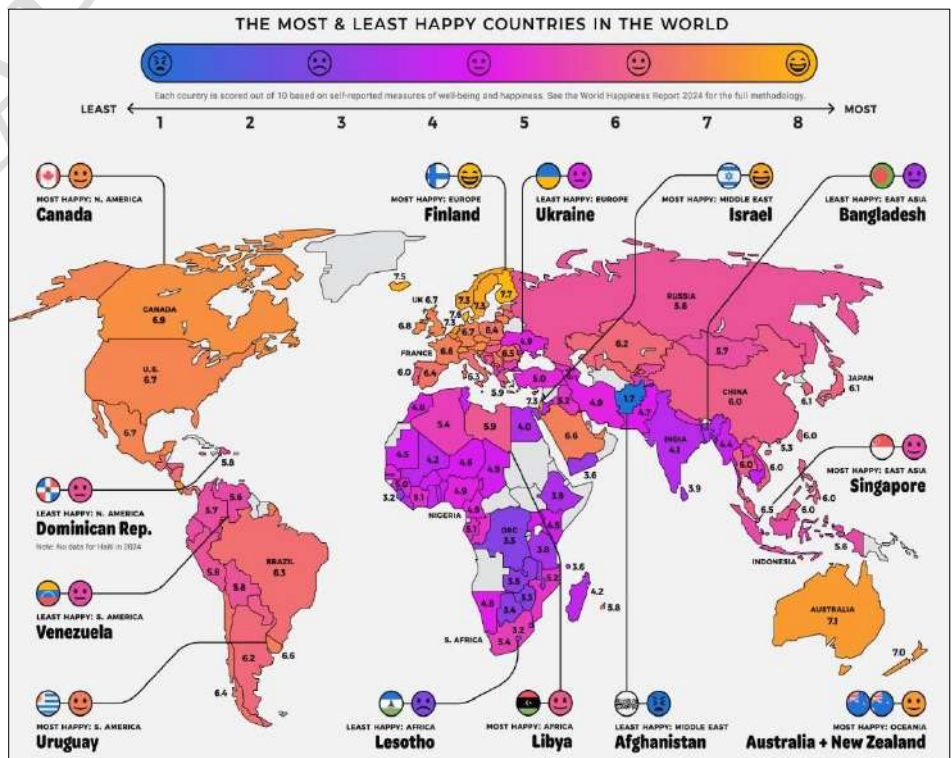
- The youth unemployment rate increased with the level of education, with the highest among graduates and higher among women than men.
- **Nature of work** – Most of the workers remain engaged in informal work and the share of regular work declined after 2018.
- **Skill development** – India’s large young workforce don’t appear to have the necessary skills with 75% of youth unable to send emails with attachments.
- **Gender gap** – Among the educated unemployed youths, women accounted for a larger share (76.7%) than men (62.2%).
- India is also facing the challenge of a substantial gender gap in the labour market, with low rates of female labour force participation.
- **Demographic dividend** – India remains ready to reap a demographic dividend for at least another decade due to the youth population remaining at 23% of the total in 2036 from 27% in 2021.
- **Areas for action** – The report highlighted 5 key policy areas for further action:
 1. Promoting job creation
 2. Improving employment quality
 3. Addressing labour market inequalities
 4. Strengthening skills and active labour market policies
 5. Bridging the knowledge deficits on labour market patterns and youth employment



11.17 World Happiness Report 2024

The World Happiness Report 2024 was released on March 20 to mark the UN’s International Day of Happiness.

- **Aim** - To measure, quantify, and compare happiness levels around the world.
- **Brought by** - A partnership of Gallup, the Oxford Wellbeing Research Centre, the UN Sustainable Development Solutions Network, and the WHR’s Editorial Board.
- **First published in** - 2012.
- **Procedure** – The *Gallup World Poll* surveys around 1,000 respondents in nearly every country on a variety of issues on a scale of 0–10.
- The World Happiness Report then averages the score from life evaluations per country over a 3 year period (2021–2023) and ranks from highest to lowest.
- **Indicators** - The ranking is based on individuals’ own assessment of their life satisfaction, alongside factors like GDP per capita, social support, and life expectancy.
- **Key findings of 2024 Report**– Ranks 143 nations and for the 1st time, the report gives separate rankings by age group, in many cases varying widely from the overall rankings.



- **Lithuania** tops the list for children and young people under 30.
- **Denmark** is the world's happiest nation for those 60 and older.
- For the 1st time since the report was published, the **United States (23rd) and Germany (24th)** did not find a place among the list of 20 happiest nations.
- The latest report discovered that **younger generations generally report higher levels of happiness** compared to older age groups across most regions worldwide.

Most Happy Countries	Least Happy Countries
Finland (for the 7 th year in a row)	Afghanistan
Denmark	Lebanon
Iceland	Lesotho
India's Case	
<ul style="list-style-type: none"> • India is ranked 126th, behind countries such as Libya, Iraq, Palestine and Niger. • The young in India are the happiest while those in lower middle rung are the least happy. • Older men, those in the higher age groups, currently married, and those who were educated, report higher life satisfaction compared to their respective peers. 	

11.18 Food Waste Index Report 2024

World wastes 1 billion meals a day, says U.N. report.

- **Authored By** – The report is jointly authored by the [United Nations Environment Programme \(UNEP\)](#) and WRAP (Waste and Resources Action Programme), a U.K.-based non-profit.
- The report was released ahead of the International Day of Zero Waste, observed on March 30.
- The [Food Waste Index](#) tracks the global and national generation of food and inedible parts wasted at the retail and consumer (household and food service) levels.
- **UNEP** – The United Nations Environment Programme (UNEP) is its custodian.
- **Food Waste** – The report defines food waste as food and the associated inedible parts removed from the human food supply chain.
- **Food Loss** – Food loss is defined as all the crop and livestock human-edible commodities that directly/indirectly, completely exit the post-harvest production, excluding, the retail level.
- **Findings** – Households across the globe wasted over 1 billion meals/day in 2022, as 783 million people struggled with hunger and a third of humanity faced food insecurity, according to the Food Waste Index Report 2024.
- The report stressed the importance of expanding and strengthening data infrastructure to enable the tracking and monitoring of food waste.
- The report pointed out that many low and middle income countries continue to lack adequate systems for tracking progress to meet Sustainable Development Goal 12.3.
- Hotter countries appear to generate more food waste per capita in households, potentially due to higher consumption of fresh foods with substantial inedible parts and a lack of robust cold chains.
- The report found that food loss and waste generated 8-10% of annual global greenhouse gas (GHG) emissions, almost 5 times that of the aviation sector.

In 2022, the United Nations General Assembly (UNGA) designated March 30 as the International Day of Zero Waste, recognizing the critical need for global action on waste reduction and sustainable practices.

Sustainable Development Goal 12.3 – *By 2020, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.*

- Food waste also contributes to significant biodiversity loss by taking up the equivalent of almost a third of the world's agricultural land.
- It is estimated the roll of both food loss and waste on the global economy at \$1 trillion.

At present, only four G-20 countries (Australia, Japan, U.K., and U.S.) and the European Union have food waste estimates suitable for tracking progress to 2030.

11.19 Global Trade Update report

The United Nations Conference on Trade and Development (UNCTAD) cited that the international trade is expected to rebound in 2024, reversing the 2023 downturn.

- The report was released by the **United Nations Conference on Trade and Development (UNCTAD)**.
- **Reasons for the economic growth in 2024**
 1. Overall, moderating global inflation and improving economic growth forecasts suggest a reversal of the downward trends.
 2. Additionally, rising demand for environmental goods should boost trade in 2024.
- **Findings in India (on an annual basis for 2023)**
 1. The export growth saw a 6% contraction.
 2. Services exports from India grew by 14%.
 3. The services sector witnessed an 8% year-on-year growth, while trade in goods experienced a 5% decline compared to 2022.
 4. The export growth saw a 6% contraction.
 5. Services exports from India saw a 14% growth in 2023.

12. PERSONALITIES

12.1 Sri Ayya Vaikunda Swamikal

The Prime Minister of India has paid tributes to Sri Ayya Vaikunda Swamikal on his birth anniversary.

- A pioneer of the social revolutionaries of south India and Kerala.
- **Birth place** – Shastamkoyil near swamithoppu in Kanyakumari, Tamil Nadu.
- **Original name** – Mudisoodum Perumal, was changed to Muthukutty due to objections raised by upper caste Hindus.
- **Education** – He had no opportunity to systematic schooling but acquired knowledge of various religious texts.
- **Teachings** – He preached ideas of equality and advocated the rights of depressed class people in the face of stiff opposition from upper castes as well as princely state of Travancore.
- He requested people to give up irrelevant rites and rituals in their worship and also campaigned against animal sacrifices.
- **Thol seelai porattam** – He was a part of this campaign to cover the upper part of the women of lower castes.
- **Turban protest** – There was restriction of wearing the headgear on certain section of caste in Travancore so he advocated wearing turban in protest.
- **Samathuva Samajam** – He started this to unite all people of various castes by organising inter-dining to accomplish it.
- **Ayya** – his followers called him respectfully as Ayya (father) and his cult was known as Ayya Vazhi (the path of Ayya).
- His ideas were collected into a text called Akila Thirattu Ammanai.

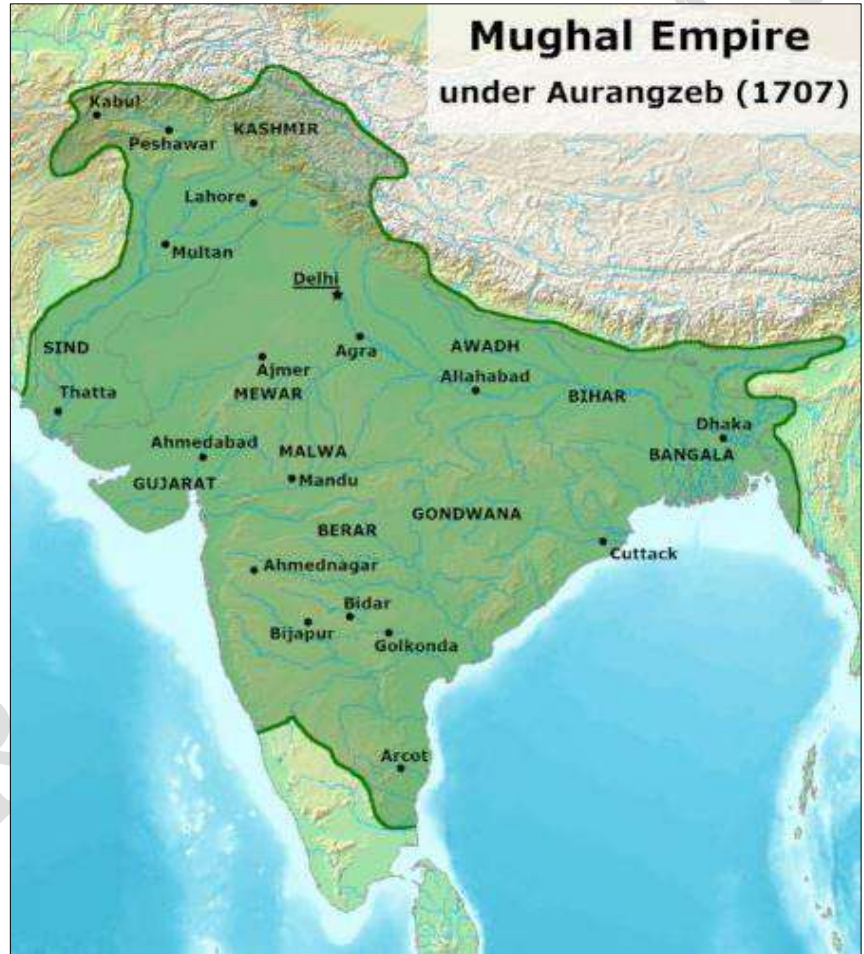
*Sri Ayya Vaikunda Swamikal criticised the rule of the British and the rule of Rajah of Travancore as the **rule of White devils and Black devils** respectively.*

- **Nizhal Thangals** – A simple temple of the Ayyavazhi religion built per the instructions of Akilattirattu Ammanai by commoners in order to worship without distinction of color, race or caste.
- **Thuvayal Thavas** – A religious exercise undertaken by his devotees.
- **Significance** – His teachings affected many social changes in southern India which resulted in the emergence of a series of social and self-respect movements such as

12.2 Aurangzeb

Shiv Sena leader equated Prime Minister with Mughal emperor Aurangzeb, saying that both were born in Gujarat.

- **Born** – [Aurangzeb](#) was born in Dohad (or Dahod) in present-day Gujarat on November 3, 1618.
- **Parents** – He was prince Khurram's (not yet Emperor Shah Jahan and Mumtaz Mahal) sixth child, and third son, after Dara Shukoh and Shah Shuja.
- **Character** – Aurangzeb grew up as a serious-minded and wedded to the Muslim orthodoxy of the day and free from the royal [Mughal](#) traits of sensuality and drunkenness.
- **Positions** – He commanded troops against the Uzbeks and the Persians with distinction and, as viceroy of the Deccan provinces in two terms, reduced the two Muslim Deccan kingdoms to near-subjection.
- **Emperor of India** – Aurangzeb ruled India between 1658 to 1707.
- In the struggle for power (1657–59), Aurangzeb defeated Dara and confined his father in his own palace at Agra.
- Aurangzeb's reign is often characterised by his strict Islamic policies, including the imposition of the Jizya (tax on non-Muslims) and the destruction of Hindu temples.



- In 1675 Aurangzeb arrested and executed the Sikh Guru (spiritual leader) Tegh Bahadur, who had refused to embrace Islam.
- The succeeding Guru, Gobind Singh, was in open rebellion for the rest of Aurangzeb's reign.
- **Architecture built** – Moti Masjid, Badshahi Mosque, and Bibi Ka Maqbara.
- **Death** – Aurangzeb died as the emperor of India on March 3, 1707.

Gujarat in the Mughal Empire

- Gujarat fell to Mughal rule in 1573, when then Emperor Akbar defeated the Gujarat Sultanate under Muzaffar Shah III.

In 1612, then Emperor Jahangir (reign 1605-27) permitted the British East India Company to set up factories (trading posts/warehouses) in the port of Surat.

- It was subsequently governed by viceroys and officers appointed by the Mughal state, and became one of its most important provinces.
- East India Company steadily increased its presence in the province after that.
- During the reign of Aurangzeb (1657-1708), the region was marred by significant instability, with [Chhatrapati Shivaji Maharaj](#) raiding Mughal outposts in the province, including the port of Surat.

Other Important Topics

Sheena Rani

- She led a DRDO team for **Mission Divyastra**, India's maiden flight test of the Agni-5 missile equipped with MIRV technology.
- She was awarded with the prestigious **“Scientist of the Year” award** in 2016.

Gyanesh Kumar & Sukhbir Singh Sandhu

- Gyanesh Kumar, Sukhbir Singh Sandhu were appointed as **Election Commissioners (ECs)**.
- **Selection Committee of ECs** - Prime Minister, Leader of Opposition in the Lok Sabha and a Union Cabinet Minister to be nominated by the Prime Minister.

Kalpana Chawla

- Kalpana Chawla was the **1st Indian-origin woman** to travel to space.
- She was born in Karnal, India on 17, March 1963 and **1st flew on the Space Shuttle Columbia** in 1997 as a mission specialist and robotic arm operator.
- In 2003, she was one of the 7 crew members killed in the NASA's Columbia spacecraft disaster in 2003.
- NASA honoured her with the naming of an asteroid, a lunar crater, and a hill on Mars.

13. AWARDS & PRIZES

Tyler Prize

- The Tyler Prize for Environmental Achievement is an **annual award established in 1973 by John and Alice Tyler** for scientific work on the environment, energy, and health.
- It is considered one of the **world's most prestigious awards** for these fields and the Tyler Laureates receive a \$250,000 cash prize and a medallion.
- The 2024 Tyler Prize was awarded to **Johan Rockstrom** for his groundbreaking contributions and pioneering work to the development of the Planetary Boundaries framework.

Pritzker Architecture Prize

Japanese architect Riken Yamamoto was recently declared as the winner of the 2024 Pritzker Architecture Prize.

- It is the highest **international award in the field of Architecture** and referred as the **“Architecture Nobel”**.
- It has been awarded **every year** since its founding in 1979.
- **Instituted by** - Jay A Pritzker, the late founder of the Hyatt Hotels chain, and his wife Cindy.
 - Yamamoto is the **9th laureate from Japan** to get this prize in 2024 and Japan holds the highest number of Pritzker Architecture Prize. The only Indian laureate is the late Balkrishna Doshi (2018).

The Order of the Druk Gyalpo

Prime Minister Narendra Modi was recently awarded the order of the Druk Gyalpo during the 114th National Day of Bhutan.

- The award was announced in 2021 in appreciation for his efforts towards strengthening India-Bhutan ties, and in particular India's provision of the first round of 500,000 doses of Covid-19 vaccines.

- **The Order of the Druk Gyalpo** also known as “Ngadag Pel gi Khorlo” is the **highest civilian award of Bhutan** recognizing lifetime service to the people and kingdom.

To refer Prime Minister Narendra Modi’s [Other Awards](#)

Abel Prize

A French mathematician, Michel Talagrand was awarded the Abel Prize.

- The Abel Prize is an **international award** given **annually to outstanding mathematicians**.
- It was established in **2002**.
- It aims to recognize groundbreaking scientific achievements in mathematics and to increase the status of the field in society.
- The prize is named after Norwegian mathematician **Niels Henrik Abel (1802–1829)** and is often called the **"Mathematician's Nobel Prize"**.
- It is awarded by **Norwegian Academy of Science and Letters**.

14. OTHERS

Operation ‘Rising Sun’

- It is a pan-India operation of Directorate of Revenue Intelligence (DRI) against the **smuggling of foreign-origin gold**.
- The Directorate of Revenue Intelligence (DRI) is the apex anti-smuggling agency of India, working under the **Central Board of Indirect Taxes & Customs (CBIC)**, Ministry of Finance.
- **Functions -**
 - Detecting and curbing smuggling of contraband, including drug trafficking and illicit international trade in wildlife and environmentally sensitive items
 - Combating commercial frauds related to international trade and evasion of Customs duty.

Asbestos

- Asbestos is a group of **naturally occurring** fibrous minerals used in fire-resistant and insulating material.
- It has been used in commercial products such as insulation and fireproofing materials, automotive brakes, and wallboard materials.

Chrysotile asbestos

- It is the most common type of asbestos, making up 99% of the world's current asbestos production.
- It is also the **only serpentine form of asbestos**, made up of long, curly fibers that weave to make sheets.
- It is also known as **"white asbestos"** because of the color of the fibers.
- It is primarily used by the chlor-alkali industry, which produces chlorine bleach, caustic soda and other chemicals used in water treatment.

Operation Indravati

India recently launched 'Operation Indravati'

- **Aim - To evacuate its citizens stranded in war-torn Haiti**
- India does not have an embassy in Haiti and the situation in the country is being monitored by the Indian mission at Santo Domingo, the capital of the Dominican Republic.



Reverse Osmosis

Experts warn that RO water with dangerously low levels of mineral content can have adverse impact on health.

- **Reverse Osmosis (RO)** – It is a water purification process that uses a partially permeable membrane to remove ions, unwanted molecules and larger particles from drinking water.
- Reverse osmosis works by reversing the principle of osmosis.
- The salt solution is subjected to pressure and pressed against the semi-permeable membrane.
- Here, the applied pressure is greater than the osmotic pressure.
- Thus, the molecules move from a highly concentrated solution to a less concentrated solution.
- **Diffusion** – Diffusion is a process by which the molecules move from the region of higher concentration to lower concentration.
- There is a net movement meaning more molecules moving in one direction than in the opposite direction.
- In osmosis, the water molecules and the concentration gradient occurs over the semipermeable membrane which allows the entry of water and blocks the passage of ions and other larger molecules including sodium, chlorine, bacteria, glucose, etc.
- Reverse osmosis is the process or the technology which is used to remove ions, mineral chemicals, and other impurities from drinking water.
- In this process, greater pressure is applied, forcing the water to travel through the semipermeable membrane in opposite to natural osmosis.
- **TDS** – In RO, the total dissolved solids (TDS), a major determinant of water quality - in water are reduced to meet potable water standards.
- TDS comprise inorganic salts like calcium, magnesium, etc and some small amounts of organic matter that are dissolved in water.
- Home filters waste nearly 80% of the water during treatment.
- The resort to restrict home filters may cause consumer to worry but it is unlikely that they will be taken to task for using such water filters.
- Various methods, technologies to remove impurities from water are – UV Purification, Reverse osmosis, Activated carbon filter, Filtration & Chlorination, Boiling and straining and Candle filter.

SHANKAR